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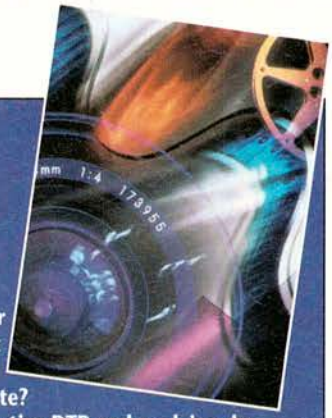

MOVIES, games and video could be an alternative theme for this issue of *Acorn Computing*. Steve Turnbull takes a look at Eidoscope and the Replay Starter Kit, do they make full motion video a reality for everyone or just the technically astute?

This month we also let you into the secret world of alternative DTP and explain why the world at large is so mad keen on C++.

– Starts on Page 23

REGULARS

Comment 13

Happy anniversary – this is the hundredth issue our illustrious editor has worked on. He reminisces on the changes in the market

News 14

Something strange is happening in the Thames, Acorn products rake up the gold awards at BETT ... Read about all the latest happenings

Techforum 38

Michael Rozdoba has a plea for games players and programmers as well as advice and tips on: colour printing, fast assembler division and repeating alarms

Public Domain 59

The release of CD-Roms by PD libraries is becoming more frequent. Teri Paul looks at APDL's DTP CD-Rom to see if this is more than just a marketing ploy

Problem Solved 68

Technical editor, Mike Cook, delves into your mail to answer another selection of your hardware questions, posers and problems

Body Building 73

This month's project is a keyboard with a difference. Learn how to make beautiful music with Mike Cook and a 32-bit Acorn

Letters 80

A selection of your views and comments. This month you air your views on: 8-bit art packages, scanning, MIDI and hieroglyphics

REVIEWS

SCSI II 49

Why is a new version of the *Small Computer Systems Interface* needed? Clem Vogler sees what features and facilities the baby brings to your machine

Leisureware 52

This month we look at strategy and skill:
- Dune II
- Driving Test

Net Book Agreement 56

There are books on the Internet to help you explore – but you have to get to them first. Pam Turnbull looks at a range of books aiming to make testing the water easy and painless

Learning Curve 62

Our teachers put some of the latest releases through the toughest test of all – the classroom:
- Rosie and Jim Talking Activities
- SUMone
- Talking Stories
- NStore
- World War II – Global Conflict

VHost 71

Would you like to set up your own bulletin board? The cost needn't be a problem with this piece of PD software – James Coates tries it out

Planning the future 79

Project management is not something which is synonymous with Acorns. PRES aim to change that and Clem Vogler sees how they have succeeded

FEATURES

Desktop Publishing 18

Bruce Goatly looks at DTP on a budget and at two new products – Textease and First Page – as he constructs DTP documents on a range of different products

C++ – language of the future 29

Easy to program and portable between platforms. Is C++ the answer to a programmer's prayer? Steve Mumford looks at the available options

Machine Architecture 34

Continuing this mini-series, this month Mark Smith looks at memory management on the Acorn platform from early BBC B days to the present and future

Vector Graphics 40

This month Steve Turnbull draws polygons on screen. Can this be done accurately and speedily and why would you want to?

Wonderland 44

Have you ever wanted to explore computer adventure games only to be thwarted by the parser, mazes and perverted logic puzzles? As graphic adventures arrive, Louise Hand gives you a definitive survival guide to the genre

HomeNet 50

So you have two machines in your house, one printer and a queue. Networking can be the most cost effective and easiest solution. Bruce Goatly investigates

Most of the editorial and adverts in this magazine were produced with ArtWorks and Impression from Computer Concepts.

THE MEGADISK

Britain's best Acorn cover disk contains hours of fun, education and useful utilities for the novice and the proficient. You'll also find programs linked to the editorial features such as Body Building and Techforum.

Full details on what you can access on this month's disk – see Page 7.

● Rosie and Jim

Jim get the sneezes on the barge in this Talking Book story from Sherston Software. Can you help Rosie discover which of the flowers is responsible?

● 3D Polygons

Steve Turnbull's program from the Vector Graphics series. Now you too can create polygons quickly and accurately

● Body Building

Three programs to help you make wonderful music in the latest of Mike Cook's projects

● Adventure Survival Guide

Adventure in to new realms with a mapping system to ensure that you never lose your way

● TechForum

How is your maths? An explanation of the division macro's core routine

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The MegaDisk

What's on this month?

- Rosie and Jim
- Programs from the magazine

Rosie and Jim: Jim Gets the Sneezes

THIS exclusive demo comes courtesy of Sherston Software (01666 840433). To access the latest in Talking Book technology you must first copy the Pipkin font from the *Font* folder into your own *!Fonts* directory, then double-click on !Fonts. Now open the window which contains the application !Sneezes. Move the pointer over this application and double-click.

After a short delay, the Sneezes icon will appear on the iconbar. This demo is a cut-down version of the full product, but those with lower memory machines will need to de-archive this program before running.

The Rosie and Jim talking books are aimed at children aged between four and six, and star the two popular rag dolls featured on Central Television. Rosie and Jim – not forgetting the Duck – are firm favourites with young children as they travel the canals, and in this story you have to help Jim and Rosie discover which flowers are making Jim sneeze.

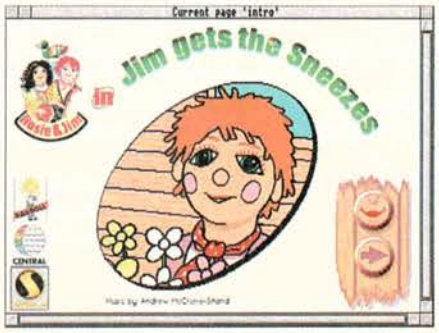
Children can ask the computer to speak individual words by pointing at them and clicking the mouse. As the story unfolds there are sound effects and animations which combine to make talking books superbly suited to pre- and early readers.

The Rosie and Jim talking books have been designed to be very simple to use. Most activities are performed by a single click. The simplest way to start is to click Select on the Sneezes icon on the iconbar, though you may want to adjust the volume before you start.

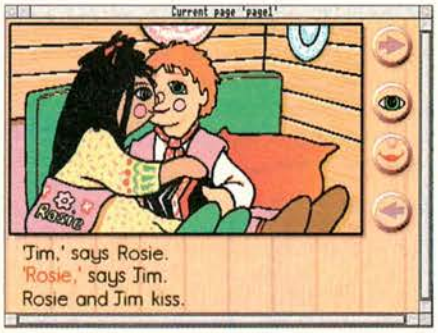
The main window contains a few icons: Top and Bottom arrows to move forwards and backwards through the book, Mouth to listen to the story being read out, and an Eye to animate the picture. Clicking on any of the words in the story causes them to be read out.

An options menu allows you to set whether single words or whole sentences (or both) are spoken. You can also set the volume and record a log file of the words. So far there are two stories in this series of Rosie and Jim stories. They are available from Sherston Software and cost £10 each.

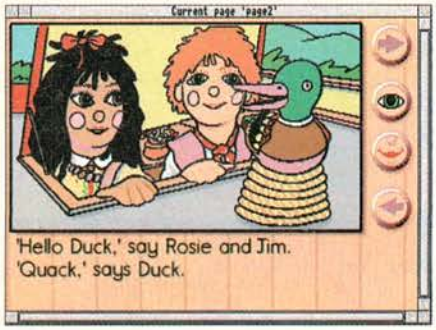
● *You can set the options for each child*



● *Meet TV stars – Rosie and Jim*



● *The interface is very easy to use even for young children*



● *Words can be highlighted as you read*

● *This story concentrates on numbers and colours*

Programs from the magazine

● Adventure	Help with mapping those tricky adventures
● TechForum	A bit of additional help from Michael Rozdoba
● Vector Graphics	Programs to help you impress and stun
● Body Building	Mike Cook introduces you to his latest hardware add-on

What's on this month?

- Palwatch
- Slideshow psychedelia
- C++ programs
- Clip-art

FAULTY DISK?

If your cover disk or 32-bit subscription disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

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If there seems to be a fault with one of the programs please contact the magazine by post describing your machine set- up and exactly what happens when you run the program.

The 32-Bit Subscription Disk

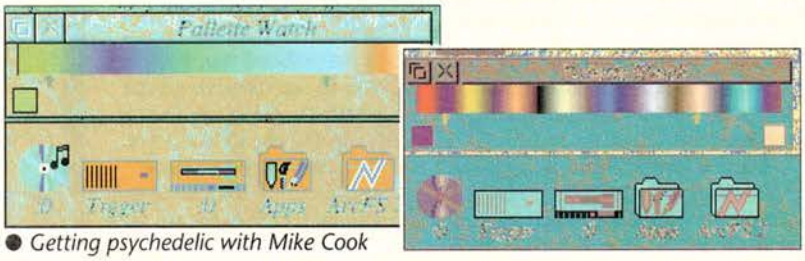
PalWatch: The changing desktop

THIS application allows you to manipulate the palette on the Risc PC. The computer needs to be in a 256 greys mode. Dragging the pointer sets the end point values, while clicking in the pointer's colour box allows the colour to be set.

The menu options allow spinning and colour manipulation. Palettes can be extracted from GIF and Clear files – just drag their icons on to the bar to load. For the best results from ChangeFSI, load the palette into here before loading into ChangeFSI.

On this month's MegaDisk is the application, a variety of palettes, and a GIF for you to experiment with. Enjoy.

Mike Cook



● *Getting psychedelic with Mike Cook*

New slides for old: Modifying !SlideShow

ANOTHER little addition for those of you with a Risc PC. Pre-loaded on to your hard disk is a rather impressive Slide Show. But how about giving this a more psychedelic feel?

Simply copy all the files in this folder into the same directory as your !SlideShow Application on your Risc PC. Then double click the *MakePsyche* file and the new application will be created from the old, leaving the old one untouched.

Then to tidy up, delete all the files you copied over: MakePsyche, Merge, ReadMeNow and the folder Psyche. And remember – if you can remember the sixties you weren't really there!

Mike Cook

Put in the frame: DTP border

A small but rather nice picture frame which works well in A5 is on this month's subscription disk. You can add to your collection of borders or use the art nouveau theme in any way you want.

● *You've been framed*

Clip-art: The primary resource

ABCart are currently working on a series of drawings produced entirely in ArtWorks, and new disks are being released at approximately two monthly intervals. Each disk contains about 1.5Mb of archived drawings and are available in either Artworks or Draw format.

The designs on each disk are based on a letter of the alphabet and cover a wide range of topics.

Each disk is accompanied by a printout of all the drawings on that disk, each of which costs £6. On this month's subscription disk we have a selection of images – and a copy of AWViewer so you can access the pictures even if you don't have ArtWorks.

Further information can be obtained from: ABCart, Tideways, South Road, Brean, Somerset TA8 2SE.

● *Clip-art can be used in a host of different applications*

C++ programs: Talking to the world

Steve Mumford has been experimenting with C++ as you can read on page 29 of this issue of *Acorn Computing*. Here are some programs to give you a flying start:

- **HelloWorld**
- **MorePrint**
- **Structure**

Next month we'll add another set to your collection.

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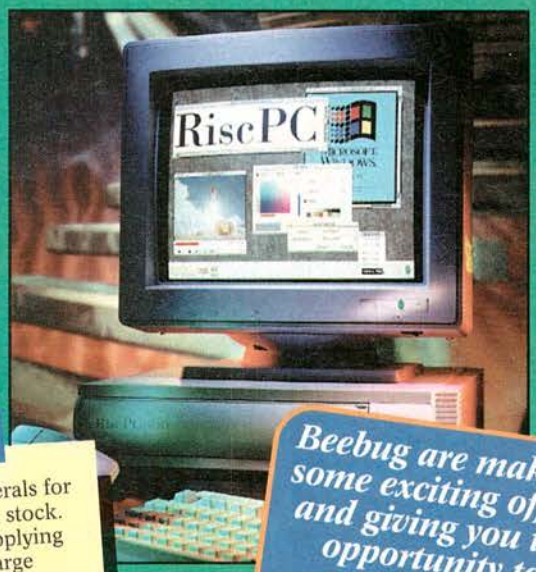

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Canon BJ10sx	229	Black cartridge	23
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Canon BJ200	246	Canon BJC600	466
Epson Stylus 300	381	250 Epson Stylus 800	
HP Deskjet 520	272	HP Deskjet 500C	305
HP Deskjet 560C	466	Double Cartridge	24
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Lemmings 2			28
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Centenary retrospective

FOR people who like to count *(One ha..ha..ha. Two ha..ha..ha.)*, the February 1995 issue of *Acorn Computing* is my – fanfare time – one hundredth issue, that is to say it's the hundredth issue that I've worked on since being invited to join the staff of *The Micro User* as it was then.

Back in the heady 8-bit, BBC Micro-filled days of Database Publications, we lived in a pure, isolated world which no other make of computer was allowed to violate – regardless of its success or popularity.

It was in November 1986 that I began working on the January 1987 issue as an Editorial Assistant – that issue seems to have gone missing from our archives, but as I recall its cover feature was the Phillips Laserdisc system for the Master 128 with the main – only? – application being the mammoth Doomsday project.

The more things change the more they stay the same. The Laserdisc was the forerunner of the CD-Rom and it ran on an 8-bit Acorn machine – try testing your non-Acorn owning friends with that tasty bit of information: *Which computer had the first CD-Rom system?*

In April 1987 Pam Turnbull also joined Database Publications and became Reviews Co-ordinator for 13 computer magazines – is this a record? We think it is, unless *you* know different.

With the June 1987 issue came my meteoric promotion to Assistant Features Editor – well, it meant a lot to me at the time – and two issues later, Acorn announced the release of the incredible RISC-based, 32-bit machine, the Archimedes A310 – while the rest of the world was still muddling around with eight or (at best) 16-bits. Our cover words said *The new BBC Micro unveiled*. Was I excited? I was.

Of course it didn't have a real desktop environment but that didn't matter, Acorn was on top again – or at least it had the chance to be.

The Christmas of 1987 passed with *no* games releases for the new machine – but then relatively few had been sold and the BBC Micro games market had yet to slow down. The magazine hit a wopping 182 pages – although larger ones had been known in the 1984-1985 period, but I wasn't there.

At this time the magazine was still produced by the original cut and paste methods with teams of typesetters and layout artists working on every issue.

In February 1988, the Cambridge Computer Z88 was released and, since it had BBC Basic, we covered it – for a year. We still occasionally get letters about it.

Christmas 1989 was a first for any Acorn magazine – we had a 5.25in cover disk containing the Superior Software puzzle game, Clogger, written by the inimitable author, Gordon Key. Gordon started his professional programming career doing type-in versions of commercial games for *The Micro User*, then he moved into commercial 8-bit games for Superior Software. At this time there were a grand total of five major games for the 32-bit machine, though the serious stuff was expanding.

April 1990 was my most significant issue – sort of – I was promoted to Features Editor which, at the time, was top of the tree. That same issue gave you the first information about real CD-Roms and the concept of Interactive Video was beginning to become widely known – the name Multimedia had yet to be invented.

The demise of Electron User occurred in August 1990 and it was re-absorbed into *The Micro User* – that particular Acorn magazine had lasted for years beyond the last Electron's date of manufacture. In November that same year, the A540 was launched with the ARM3 processor. By Christmas 1990 there were, at last, *lots* of excellent games for the 32-bit machines.

The years 1991 to 1992 were certainly strange ones. The switch to American A4 size, the fact that for six months the year wasn't printed on the spine, and the curious one-off June 1991 issue which was distinguished by two things: It was stapled instead of being perfect bound, and it was the 100th issue of *The Micro User*.

Also through these years, Pam went from Reviews Co-ordinator, to Reviews Editor, then to News and Reviews Editor – she was catching up on me. So in February 1992 I promoted myself to Editor.

From 1991 to 1992 it has to be said that the magazine circulation declined rapidly until we finally managed to push through the name change to *Acorn Computing* in October 1992, and a 32-bit coverdisk was added. The turn-round on the sales graph was quite dramatic. At last the magazine's title reflected the product. I was much happier.

December 1993 saw Pam being promoted to Deputy Editor, and I had nowhere to run. And that's how it's been till now.

Steve Turnbull waits for a telegram from the Queen

Steve Turnbull

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Speaking in tongues

SUPERIOR Software's (01652 658585) Speech! was the only speech synthesiser for the Beeb, made a successful transition to RISC OS some years later, and can be found combined with such programs as Talking Pendown and FullPhases. Superior have now updated the program and added a host of improvements.

Speech! 2 has an extra 3,500 words in a completely revised exceptions dictionary, plus modification of intonation which gives better speech quality. A new easy-to-use word editing facility lets you add your own words such as technical terms or place names.

Interactive help is supported as are accented characters, and four new phonemes have been added for use with foreign languages.

If you want access to German and French you can obtain German and French versions around Easter-time. The former has been developed by German programmers and is particularly useful in helping with pronunciation.

A spelling test is included which can be easily modified to test particular aspects of the language such as verb conjugation or adjective endings. Word editing is also available and as with Speech! 2, the German Speech! module can be used directly with Talking Pendown and FullPhases.

Speech! 2 costs £29.95 or £10 (inc VAT) for an upgrade, while Speech! 2 + German costs £34.95 or £15 for an upgrade. To upgrade the Talking Pendown or Full Phases Speech! module, just quote your registration number when ordering.

● *You have control over the way your words are heard*

● *Learn to spell in English or German*

Burns night

CAMBRIDGESHIRE Software House (01480 467945) have taken their successful Frontier 2000 and crossed the border to Dumfries. The result is The World of Robert Burns on CD-Rom priced at £79.95 which includes Replay/MPEG files of archive interviews with experts, presentation of songs and poems, plus text and graphics forming what is probably the most comprehensive collection of information on Burns ever. Aimed at Key Stage 3/5 English you can buy a floppy disk version – without the Replay files and some of the larger images – for £49.95.

Using the Frontier approach, which has been refined and enhanced, you can set your own trails very simply in Edit, enabling teachers or Burns enthusiasts to use the data on the CD as they see fit. Available in March this will need a minimum of a 2Mb machine.

BETT winners

JANUARY saw the eleventh BETT show at Olympia with this year's buzz-words being *broadband* – the information superhighway of Internet and Online Media's STB approach – and *OILS* or Open Integrated Learning Systems. The UK approach to the latter looks as if it is going to divide into two, so what we are looking at is a compatibility issue across platforms, or straight importing of the US programs.

Despite the superficial support for OILS in the education market, there are reservations on how this system will perform in the UK. Will it work well with under-achievers while leaving high and average achievers worse, or no better as curiosity and interest in learning and education is sacrificed for quantifiable statistics so loved by bureaucrats?

Award winners at this year's event were Sherston Software who won the Bronze Primary Award for Time Detectives – The Victorians and Topologika who were presented with the Gold Primary Award for Music Box by Secretary of State for Education, Gillian Shepherd.

Acorn themselves won the Gold Secondary Award for the Risc PC, while the newly created Special Needs Awards went to NW SEMERC for My World 2+2, and SEMERC and the Concept Keyboard Company for Informatrix, while Gold went to Crick Computing for Clicker.

● *The movies will be in Replay or MPEG format depending on your hardware*

● *Sample the area, or create your own trail*

Simms for the memory

SENLAC (01273 208074) are now able to supply 32Mb Risc PC SIMMs for £799 (inc VAT and UK delivery). Previously this price was £1100 inc VAT – a reduction of over £300. These SIMMs are made for Senlac in the Far East to the Acorn specification.

Delivery is ex-stock but there are occasionally delays of 2-3 weeks when stocks are replenished. 64Mb and 128Mb SIMMs are expected to be available in the not too distant future, but pricing has not yet been set.

PD-CD mark two

DATAFILE, in conjunction with DeskTop Laminations/CD Circle, are formulating a re-issue of the CD-Rom minus some of the JPEG graphics which caused concern. PD-CD1 (issue 2) will contain over 475Mb of fully archived files for £36. CD-Circle will upgrade the CD for £10 when you return your original CD-Rom.

For further details you can contact Desktop Laminations at PO Box 332, Bristol BS99 7XI. Tel: 0117 979 9979.

Alternative images

ALTERNATIVE Publishing (0141 248 2322) have added Amiga IFF and HAM file support to Image FS. Free upgrades are available to registered users.

Image FS allows you to convert graphics from Macintosh, PC and UNIX platforms totally transparently. For instance, you can drag a TIFF file directly into Paint or Draw. Windows BMP and Apple PICT files up to 24-bit depth can be converted as well as PCX, Clearfiles, Targa, PBM, MacPaint, Atari-GEM, Gif and Colorix. Image FS also supports 32-bit CMYK TIFFS.

Image FS is still available at the introductory price of £34.95 which has been held over until April 30.

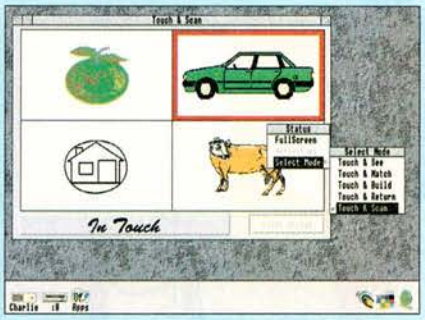
First steps

HAMPSHIRE Microtechnology Centre (01705 378266) have produced a program to assist with the early stages of a child's cognitive development. Called **InTouch**, this is an open-framework Concept Keyboard program which encourages recognition, matching and sequencing activities.

You can add your own pictures and sound samples. InTouch works in fives modes: Touch and See, Match, Build, Return and Scan. With *Touch and See*, touch a picture, word or symbol on the overlay keyboard, and it appears on screen. *Touch and Match* requires you to match the screen to the overlay keyboard. This activity can also be used as a memory test.

Touch and Build encourages the creation of a picture and sounds on the screen, and *Touch and Return* is an adaptation of pairs or pelmanism. A picture appears on screen and then disappears until the matching item is touched on the keyboard.

Finally *Touch and Scan* uses the keyboard as a switching device. The pictures can be scanned and selected in single or double switch mode, usually in a pre-selected sequence, but a random order is possible. Best use of this can be made with a symbolic language such as Rebus.



● *Design your own activities or use the ones provided*

Every one a winner

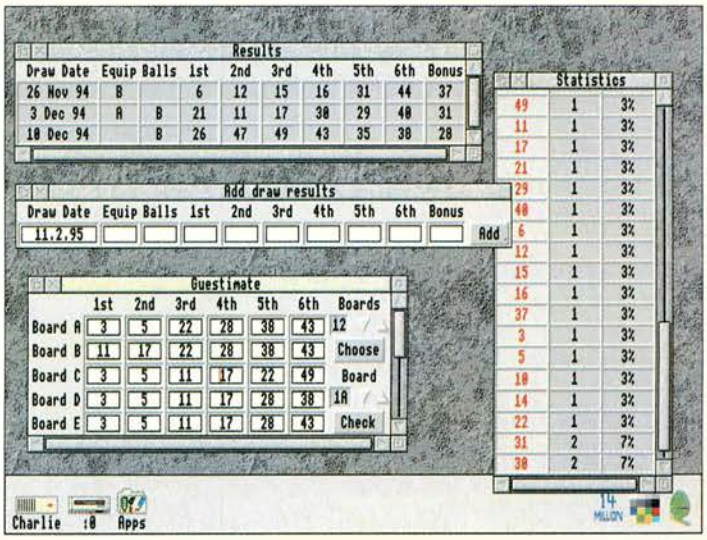
ARE you planning to buy a Lottery Ticket this week? Well Cherisha Software (0956 389500) want to bend the odds in your favour with Otteryl. This is a statistics-based application for the National Lottery. The program costs £3 and while it can't guarantee winning, it will lessen the likelihood of picking cold or hot numbers, so avoiding common patterns. So should you win, your winnings will be higher.

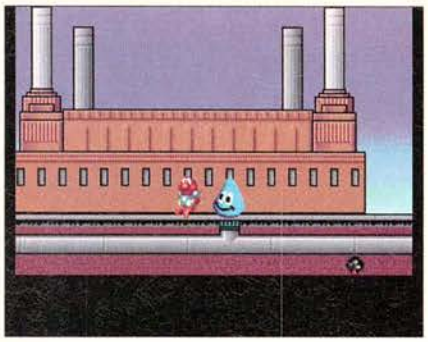
Otteryl comes in four parts. The *Statistics* window shows how many times each number between 1 and 40 has come up in the weekly draws, and its percentage overall. *Results* tells you the machine and set of balls used and the numbers for the last three draws – all the draws are kept but are not visible.

Add draw results is the third window and lets you update the results of each new draw so that the statistical analysis can be carried out. Finally, *Guestimate* lets you check a board of six numbers or generate one, four, eight or 12 boards automatically. According to Cherisha, this is based on pattern creation and avoidance as well as the *largely irrelevant* past results. The program features interactive help as well as drag and drop so that numbers can be dragged from one window to another.

The boards are then checked and certain patterns and number sequences will trigger messages. If you choose more than one board, different numbers are chosen and placed in such a way as to cause any three of the numbers to appear together somewhere on one of the boards, so maximising your chances of winning more than £10.

● *This could be your lucky day*

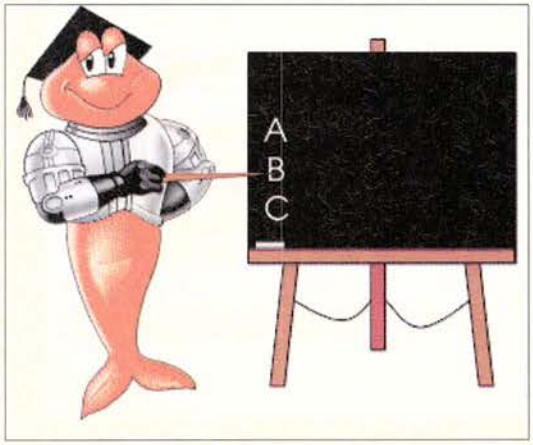




● *James' journey takes him to various London landmarks*

Putting Pond on the Thames

JAMES Pond is making his educational debut in James Pond Underwater Agent, one of two new software packages from Thames Water. James is set the task of ensuring that the Thames Water's pride and joy, the London Ring Main, is up and running and ready to supply water to London. He has to solve a number of problems to get Ronnie the Raindrop from a passing cloud into the tap, along the way covering topics useful in Key Stages 1/2 of the Geography and Science National Curriculum. It's all done in a lively way, using arcade-style action and gameplay.



● *The hardest mission so far?*

The other package, Running Water, is aimed at Key Stages 3/4 and is based around a simulation of managing and running the Ring Main in the most cost effective way. It is based on Thames Water's Control Centre at Hampton in West London and takes into account water demands at different times of the day and year, and problems caused by maintenance, flooding and burst water mains.

Both packages have lots of information in them about water supply and the Ring Main, and are supplied in a twin pack together with a set of teacher's resources that could form the basis of several week's work.

The pack will be available in the new year as part of Thames Water's Educational Service within their area. GamesWare (0703 457333), who developed this new adventure, will be supplying the pack around the rest of the country.

John Allen

The Snowman

Millennium Interactive (01223 844894) have announced plans to release CD-Rom versions of both The Snowman and Father Christmas based on the famous Raymond Briggs stories and cartoons.

These *edutainment* CDs will be faithful to the originals and will be released on all major platforms and consoles – Millennium are seriously considering an Acorn version. The release date for these will be late Autumn 1995.

Note: Following the PD Snowman demo mentioned in Teri Paul's column in the Special issue, Snowman Enterprises (0171 388 2222) would like to point out that there is currently no *authorised* version of The Snowman in any computer or electronic game format.

Have a go

COMPUTER and video games can have a strong positive impact on child development according to Professor Stephen Heppell of Anglia Polytechnic University.

Heading ULTRALAB, the learning technology research centre, Professor Heppell believes that parents need to get more involved to ensure that children get the most out of computers:

"Many of our findings run against the established cliché of computer and video games having a derogatory effect on children. One finds that the way in which children approach problems presented by the game is frequently very close to the way they should solve problems in their science classes at school. The challenge to parents is for them to help children see that the approach they use when playing computer games may be used elsewhere."

He would also disagree with the image of the games player as a loner. Children he and his colleagues have studied use language well when describing games and play well in mixed age groups. A particularly useful form of play is with parents.

"It's actually useful for a child's self-esteem to have some areas where they can do things better than adults. While for parents it is easier to talk to children about strategies and approach when playing a game, and this form of communication is an invaluable part of the learning process."

Building blocks

THE latest programming utility to come from Oregan Developments (0121 353 6044) is BasicAOF. This program enables the Basic inline Assembler – built into RISC OS – to export ARM Object Format (AOF) files – useful when mixing Assembler and C as you can use the strongest features of both languages.

Whereas C gives you portability and the power of RISC OS C libraries, if you write code in Assembler you can exploit all the speed of the ARM processor and access the hardware or operating system directly. All for £39.95.

What's on

The Education Show 1995
March 2-4
NEC, Birmingham
Contact: EMAP (0181-984 7711)

Protecting children through multimedia training
March 2-3
University of Central Lancashire, Preston
Contact: LANPOL (01772 892253)

ARM Club Open Day
March 19
Merton Court School, Sidcup, Kent
Contact: (0171-624 9918)

Computers and Dyslexia
April 21-23
University of Nottingham
Contact: BDA (01737 765851)

Acorn User Show
May 6-7
Harrogate International Centre, Harrogate
Contact: Safesell (01737 814084)

Northants Acorn Group
Second Monday each month: 7.30pm
Co-op Hall, Havelock Street,
Desborough, Northants
Contact: T Cowley (01536 762713)

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King William Broken Henry
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CUSTOMOM РУССКИЙ
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First Wrds Royal Cirgeb
Birthday LOMBARDIC
Gesele Paganina
Creedmore BENNY
KUNG FORSS Chopin
Beatville MANIA
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EDITION STEMS Dickens
CARADIS FOXTROT
Mixbrt

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Skippy Dragon Wick
Phoenix Pixie
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ASSORTMENT
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Bad Boy Sans Serif
IMPRINT BELIEF X
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Genoa Mira Scout
FOLDER Nordic Fred
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DTP – back

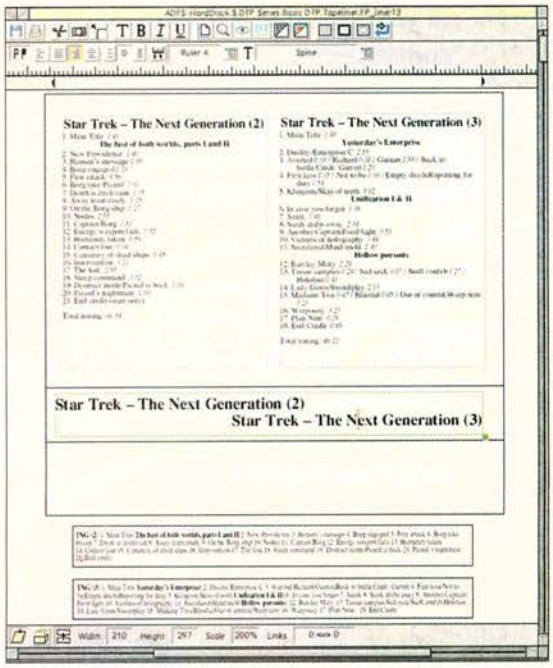
Bruce Goatly re-evaluates the need for DTP

LONG ago, in a distant galaxy, far, far away – well, call it something like six or seven years ago – in darkened rooms mighty sages decreed that computers would be more than just glorified calculators and typewriters, and would be empowered to assemble complete pages, illustrations and all. And so they brought forth *desktop publishing*, calling it DTP. And we beheld it, and we tried it, and lo, it wasn't too bad.

● *A subtly worded party invitation prepared with First Page*

From time to time, however, I get these dark, cynical and seditious thoughts that it was all just a clever way of making people want – or as computer manufacturers would put it, *need* – bigger and more powerful machines, with better and better monitors, and faster and higher-resolution printers. Are the majority of the nice features really needed by most users of DTP packages?

Do you really have to pay over £50 for software when you can get all the functionality you need for half that, or less, or even for nothing? In this article we'll be looking at what might be termed *entry-level DTP*, taking a retrospective and occasionally sideways look at the basic uses DTP is put to, and whether for some of them we really need it at all – perhaps you have other software around that can also perform DTP-like tasks?



● *The completed cassette inlay and labels*

DTP – why?

For a start, hands up all those who started using a DTP package because they needed to do word processing and thought the extra bits might come in useful some time. I will readily admit to having started out as a Wordwise Plus user on the Archimedes – I still have the disk and box close to hand – mainly because I graduated from a BBC Model B and wanted to stay with the familiar, but partly because I wasn't overly impressed with 1st Word Plus.

Acorn DTP, when it appeared, seemed miraculous by comparison, but was really slow in operation and lacked word processing abilities. Then Impression arrived and we were all duly excited by the thought of being able to create fancy documents complete with illustrations. Ovation quite justifiably has its own adherents too.

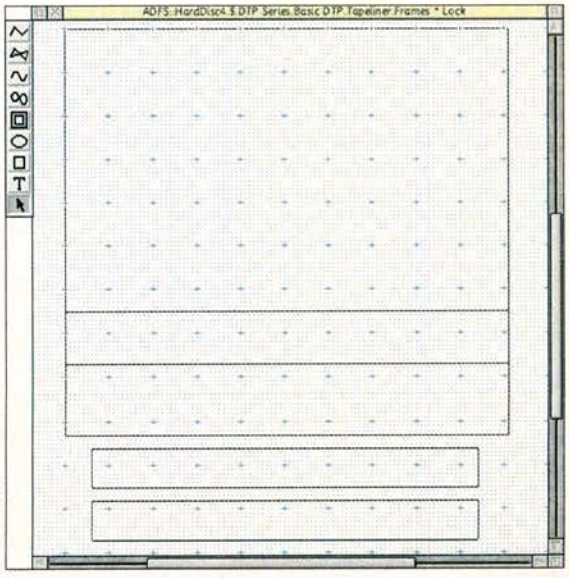
But how far do we actually use the facilities on offer? One way of thinking about this is to consider how often you've needed to use the manual – if it's stayed mainly on the shelf since you installed the software, it's a fair bet that you're under-using it.

In my mind's eye I see throngs of Acorn users churning out letters with Impression – no real harm in that, I do it too because it's convenient – and producing other items only occasionally. On the other hand, if you haven't yet bought a DTP package and have a restricted budget, you needn't despair.

Leaflets, newsletters, advertisements and brochures – all can be produced with little fuss and considerably less expense than going for the mainline options. The most important feature of any DTP package, of whatever price or vintage, is the ability to import text and to edit it afterwards.

There is plenty of choice apart from the Impression/Ovation axis. On the educational front there are a couple of packages that have been around for a while – Pendown Plus from Longman Logotron and Desktop Folio from ESM.

Also, although it's dearer and its main strengths are in document structuring, don't overlook the possibilities of EasiWriter, which you may already have bought for use as a word processor. First, however, let's take a couple of new



● *Setting up the inlay borders in Draw*

products as a starting point, beginning with First Page.

Longman Logotron has aimed First Page at beginners who want full functionality on a budget. At £49 it's not the cheapest, but it has some interesting and powerful features, such as the ability to rotate text as well as graphics.

Tidy those cassettes

The first example is a cassette inlay. It's funny how many programs have been written over the years to generate these essential objects. The problem is that sometimes you need to fit a lot of information into a small area, and they can look awfully plain.

to basics

The tapes themselves also need labelling, for which you need sticky labels. The example here is based on the premise that both inlay and labels can be printed on a full-sheet sticky label – it's thick enough to be used as the inlay card without being peeled and restuck, or you can stick it on to thin card before the final trim.

First, the framework. In First Page you can't define a frame's exact size, only drag it to size using Adjust with the grid as a guide. This is a tad awkward because there's also no way of altering the horizontal and vertical sizes independently of one another.

No problem – you can always use Draw to create the printed borders, then import them to the First Page document and fit the text frames inside. Two frames will do it, one 101mm by 93mm for the overall size, and the other 101mm by 12mm for the spine, placed 65mm down from the top edge. The tape labels themselves are 88mm by 9mm, and you need two of them.

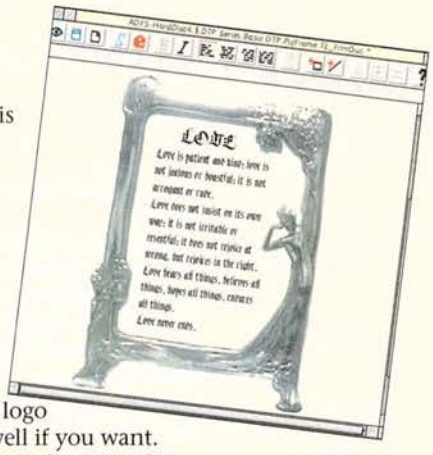
The tape in question has 21 short items on one side and 18 on the other, divided into subjects, so very small type is needed. In fact it's five-point type with the leading reduced by a point, and the tape title is in eight points. The track timings were put into italic to distinguish them from the titles. The original text was prepared in Edit and dropped into separate text frames in First Page, with the various styles being added later.

The advantage of this was that the texts for the tape labels were easily derived from the inlay text.

After they had been dropped into the text frames they had to be processed to five-point type and made thinner by being squashed down to 80 per cent aspect ratio. Because First Page uses a *style* system to give attributes to text, it's easy to change what your headings or all similar text looks like.

Although it's possible to link frames in First Page, there was little advantage in doing so here – each of the elements is self-contained. It's also worth locking the frames in place with Control+L once you've positioned them, to stop them moving about accidentally.

To enliven the appearance you can add a scanned picture or a piece of clip-art. The important thing is to maintain the legibility of the text that goes over it. If you have a scanner, use the software to tone it down to pale greys, and if necessary still further with Paint. Put a logo on the spine as well if you want.



● *Using Textease to frame a favourite quotation*

The whole thing takes up only part of an A4 sheet, so you could do several at once. The only real limit to how small the type can go is the resolution of your printer – you may be able to use smaller type if you put the text in Homerton or some other sans serif typeface.

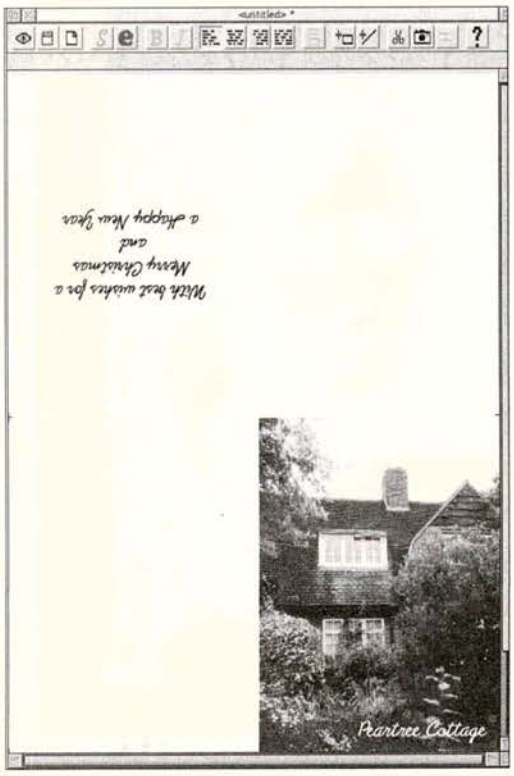
Yes, you shall go to the Ball

As I write, Christmas has only just passed, and the season of parties is still on my mind. So let's look at a simple invitation to a party.

The main problem here is with choosing appropriate typefaces for something informal like this – it's all too easy to pick one that's hard to read, or worse still to fill it with half a dozen faces that not only don't match but clash horribly. The example uses only two, and the heading is not the heavier of them, it's just bigger.

The yellow shadow to the heading text was made by copying the whole frame – there's a Repeat function for this – then offsetting it slightly and applying a yellow style to the text in the lower of the two frames. This gives a slight *lift* to the heading when printed in black. The frames need to have their type changed to Normal so the text doesn't try to flow round them.

It seemed like a good idea to stagger the next three lines – they're aligned left, centred and aligned right respectively. Aligning the rest of the text to the right gives a more solid feel to the outside edge while adding to the impact caused by ➤



● *Design your own folded cards*

➤

the cork and stars coming out of the bottle.

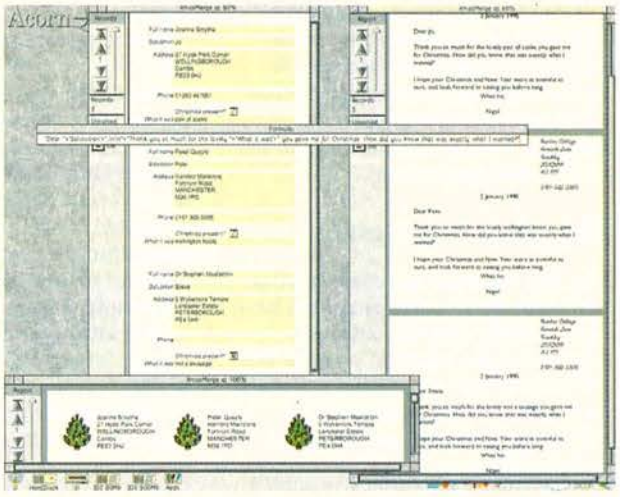
The picture itself was the other way round in the original, which was obviously wrong for this design of card – the rule is that you should generally have people and objects looking into the page. First Page fortunately provides a Reflect option for graphics to cure this.

Greetings from the frozen south

Continuing for a moment with the celebration theme and turning to TextEase, the new package for small jobs from SoftEase, the next example is a basic greetings card designed for printing on one side of a sheet of A4. Simple, really – just divide the page into quarters and place the picture and associated text in the bottom right, with the greeting upside down in the top left.

Placing text upside down in TextEase isn't as easy as in First Page, in that there's no option to rotate text. That's easily overcome of course, because you can always type the text in Draw, convert it to a path and rotate it before importation as a graphic.

The picture is a bit dark and gloomy – it was really to show relatives overseas what the ancestral home looks like – and again there is plenty of clip-art around at reasonable prices to suit whatever occasion the card is for, be it Easter, birthday or congratulations on passing a driving test. Printing on pastel coloured paper can add interest and appeal.



● *Send all your friends and relations sincere thanks*

It's a frame

You may have a favourite quotation or poem, or you might want to send someone an unusual greeting. How about putting it in a frame? I recently digitised a rather nice Art Nouveau frame and thought it might look good on paper. It's all right up to about A5 size – the wonkiness is authentic – but after that the pixels become obvious.

You can easily drop it into a TextEase document and overlay it with words to make an attractive sampler. The main problem is in getting the text size and the line spacing right so the quotation fits evenly, avoiding the lumpy bits. The title neatly fills an awkward space.

The frame has a transparent interior, so if you want to put a picture in it you can. It's not exactly DTP, but Draw does the trick quickly and easily – just use white rectangles to cover up any extraneous pieces of picture outside the frame.

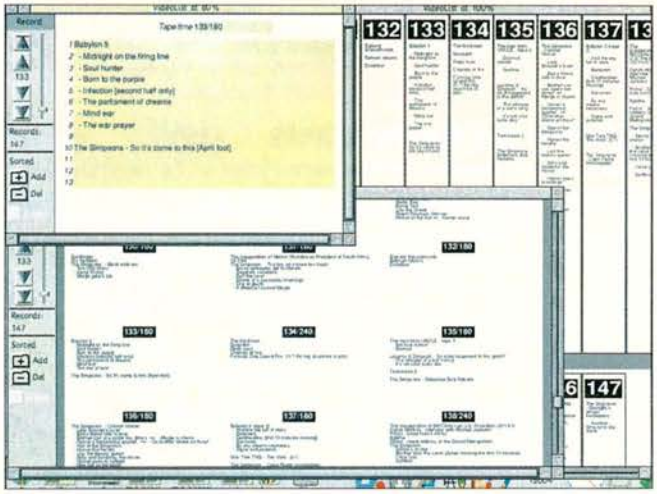
● *Framing a portrait with Draw*

Contemplating mergers

One of the traditional strengths of word processors is their ability to merge variable pieces of data with a standard form document to produce apparently personalised letters. Hardly anyone is fooled by this any more, but it does mean that the right letters go to the right people, at least in theory.

If you have to send a similar letter to a defined group of people, mailmerging is extremely useful and timesaving. If you don't have a word processor or DTP package that can do mailmerge, maybe you have a database that can do the job instead.

DataPower from Iota, for instance, has features – probably under-used – that take it well beyond being a basic database, among them being the ability to create reports really easily and mix graphics, standing text and text generated by formulae together. You



● *Keeping the videos in order with DataPower*

can therefore write semi-personalised letters and fill in the gaps from the database, and even print jolly labels to stick on the envelopes.

The example is of a thank-you letter based on a fictitious database of family and friends that lists the presents that were received from each – some families are *really* organised, though sadly not mine. The record cards are at the top left and list the salient details for each person, including a salutation name to follow the word *Dear* in the letter.

At the bottom left are the address labels, set up for 24-label sheets, with an appealing emblem on each that was laid down as a graphic on the report master page. The letters themselves, on the right, are a separate report with a variable paragraph generated from a single simple formula, which is the band across the middle of the screen. Remember to select first for those who sent presents.

The letters themselves could easily be brightened up with a decorative border, added in the same way as to the labels. You could take a motif and replicate it in Draw, or use a ready-made border such as the one on the November 1994 *Acorn Computing* MegaDisk.

More labels

For well-ordered households with a video recorder, keeping track of recordings is always a problem. Our family catalogue is now computerised, so that as long as the machine is turned on, any recording can be located within seconds.

Labelling the tapes is a real doddle too – again using DataPower's report generation facilities. As you can see from the example, there is space for up to 13 different items on a tape.

The front and spine labels are generated by fairly simple formulae with the tape numbers picked out in white on black. Again, to keep this on a DTP-like track, you can add a family logo or emblem, or other decoration. Better yet, add your name and address to each in case you or other family members are in the habit of lending out these precious artifacts.

Edit and Draw

We mustn't overlook the least expensive option of all – using Draw to combine text from Edit with illustrations from Draw and Paint. It may not be the most convenient or easy-to-use DTP suite, but it works and can achieve quite complex effects – with a bit of work.

The main limitation to keep in mind is that each document is effectively one page, though two A5 pages can be printed side by side on a landscape A4 page. This is useful for preparing A5 leaflets as well as more elaborate A5 booklets so long as you keep track of which pages have to be printed with which.

The keyword with this arrangement, at least in the initial stages, is trial and error. Fortunately, when you spot something you want to change, you can export a text area back into Edit – or re-edit your original – and save it back into Draw quickly enough for it to feel pretty interactive.

The example menu shows what a piece of text looks like using some of the formatting commands understood by Draw. It could be improved by judicious use of line spacing commands, though it isn't bad as it stands.

Gently does it

Not long after the appearance, for Acorn machines, of art packages that allow graduated fills and metallic effects, our esteemed Editor complained to me that computer art looked computery rather than artistic. In fact you could tell which package the art was produced on by the effects used. People were starting to use all the new features together inappropriately, in an apparent attempt to dazzle the onlooker with virtuosity.

The result was merely overwhelming. The same syndrome can occur with DTP – massive numbers of fonts, gratuitous graphics and outlandish arrangements are all traps for the inexperienced which often fail to work as expected.

The plain message of this is exactly that – keep it plain to start with, and work your way up gradually. Don't be persuaded that you really *must* get the biggest and best software and machine, at least not until you've got the hang of the basics.

There's plenty you can do with less complex software, and it can act as a useful rein on excesses of creative urges as you develop your skills on playbills, newsletters, handouts, advertisements and all the other things I've not expanded on here.

● *A mouth-watering evening in prospect, using only Edit and Draw*

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Making movies

Steve Turnbull looks at what's new in the world of Full Motion Video

THE area of Full Motion Video – taking a file of moving video with synchronised audio and displaying it on a computer screen – is a strange one because it is not an end in itself. There is no point to it. After all, video tapes can do it easily enough and with *much* better quality.

However, it is a symptom, perhaps temporary, of the inexorable take-over of the all-encompassing digital data from all the earlier forms, like tape. Everything is being made digital so it can be transmitted and stored through all the same media and accessed by anyone, anywhere, anytime. Well maybe, eventually.

So what *is* the point of FMV? In a word, multimedia. The huge capacity of CD-Roms has meant that it is feasible to enhance database products – and most CD-Roms are databases no matter how cleverly they're disguised – with moving pictures.

Now if you've got to have moving pictures then you've got to have a moving picture editor. After all, how else are you going to trim off the bits you don't want, put on captions, insert sections from other recordings and add the dialogue or music or both?

You need an editing suite, and for Acorn machines, there are two: Empire by Uniqueway and the new Eidoscope from Eidos. We reviewed Empire in the October '93 issue although you can be sure it's been enhanced considerably since then.

A fully professional Acorn-based – Aladin Octopus – *offline* video editing system was reviewed in the Special '93 issue. In a professional *offline* system, a frame-by-frame copy is made of the source images and each frame is given a *timecode* which uniquely identifies the frame on the tape, in the format of *HH:MM:SS:ff* – hours, minutes, seconds, frame.

The editor (the human one) then uses his offline editor system to select the order of the shots, which sound track to use – which may come from a different tape or tapes – and at which points, identified by timecode, to switch or fade between sources.

Another buzzword used to describe this sort of system is that it is *non-linear*. In the old days of film, editing was linear. The editor literally cut-up and spliced the original film sections to form the final cut. Non-linear means that different sections of a tape or tapes can be accessed randomly (and repeatedly) for cutting together.

All the selections form what is called a *Decision list*, and this list is then given to a studio which loads up all the sources and runs through the decision list with the original data to form the final cut – this is the *online* step. Now you could do the *offline* step in the *online* suite, but it's much more expensive because the equipment has to be broadcast quality.

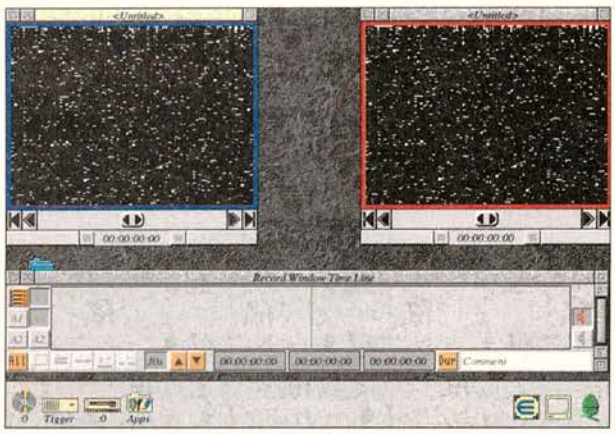
As an interesting sideline, the magazine was once given the *offline* cut of Michael Palin's *Around the World in 80 Days* series, and running at the top of the screen through the whole thing were the timecodes.

For an FMV editing system, we need to have the same sort of features. However, the system is effectively *non-linear online* because it is dealing with the original digitised images – digital copies are the same quality as digital originals, there's no degradation – but can access the frames randomly, just like a modern *online* editing suite.

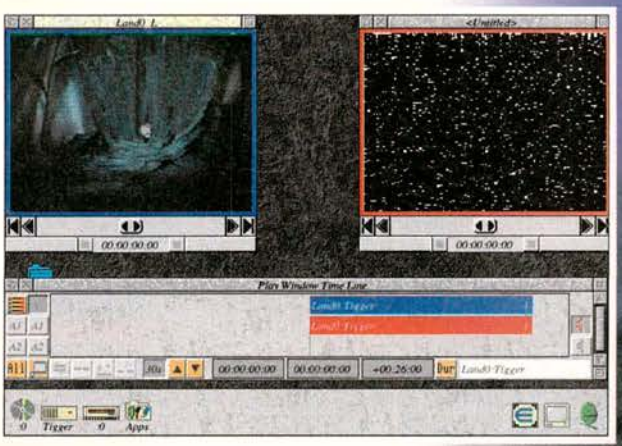
The Empire system is the editing ➤

PRODUCT SPOTLIGHT

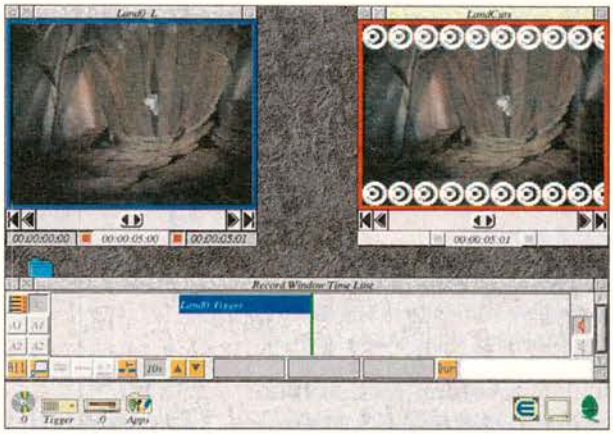
Product: Eidoscope
Price: £169
Supplier: Computer Concepts, Gaddesden Place, Hemel Hempstead, Herts HP2 6EX.
Tel: 01442 63933
Requirements: Risc PC, 8Mb recommended (4Mb min), Eagle M2 card, lots of hard disk space



● *The empty Eidoscope program*



● *The first frame of single source, the timelime shows the Play (left) window*



● *A five second clip cut across to the Record window, showing the dummy end frame*

➤

suite for uncompressed Acorn-format Replay files. This means that you need absolutely enormous quantities of hard disk space to work with anything of any reasonable length or frame size.

In comparison, Eidoscope works on its own *ESCaPE* format in which the frames are individually compressed. This means the system works with compressed files, so less space is needed.

Having said that, let's make no bones about what you need to do any sensible work with either system:

Five to seven seconds of ESCaPE compressed video data (without sound) occupies at least 3.5Mb. Acorn compression systems – Moving Lines and Moving Blocks – can be much more effective, but the frames are compressed relative to the previous frame which means you can't sensibly edit the compressed version because you can't scan backwards easily.

The Replay system itself is not compression-method specific. The two methods mentioned in the previous paragraph – plus uncompressed – are supplied by Acorn themselves. MPEG is another and can be added as an upgrade to Replay. It would be possible to add FLI and AVI decompression as well, although such files would need to be given Replay headers to work.

The software to handle the Acorn compression methods is supplied in the ARMovie pseudo-application and can be run with the appropriate front-end. With the Eidoscope system comes the necessary upgrades to allow the ARPlayer and ARMovie to play and compress ESCaPE files. As the decompress upgrade is not freely available, it could limit the number of potential viewers.

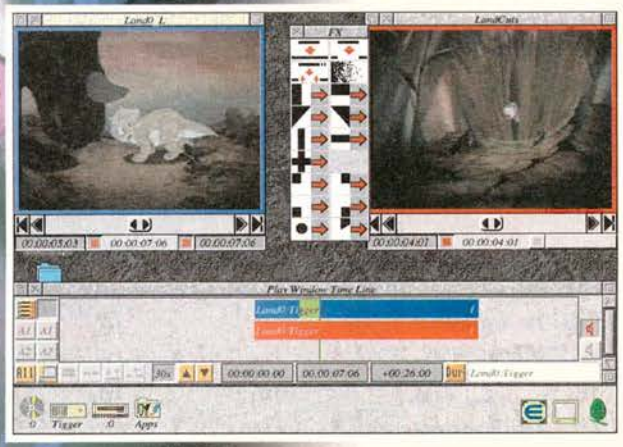
Eidoscope needs the Eagle M2 card to perform its video capture and digitising. This is because the compression is performed as the grabbing progresses, and only the Eagle software knows about ESCaPE. It checks to see whether the MovieComp module is available, and if it is, it is loaded and the ESCaPE option becomes unshaded on the Replay grab formats.

Video grabbing is simple on the Eagle card – you just plug in the source, specify a destination directory and when the appropriate part of the video is displayed in the viewing window, you click *Record*. A rough grey version of the source is dumped to the window every few moments, so you can see how far you've got and click *Stop* at the appropriate point in time.

Of logs and things

Loading up Eidoscope presents you with three windows. Top left is the *Play* window which generally consists of the source material, while top right is *Record*, which contains the compilation of the shots and sound so far.

The long, bottom window contains all the tools and information needed to manipulate



● *Fading a new clip into the last second of the original*

the material in the other two windows. There is the timeline which shows the various clips and where they start and stop in time.

The system has three tracks, one video and two audio, which relate to the video, and two audio channels that a Replay file can have. The V, A1 and A2 buttons on the left of the timeline specify which of the tracks are transferred from the Play window to Record when an Edit is performed.

A green line in the centre of the timeline indicates which frame is currently being displayed – the timeline relates to either the Play or Record window. A zoom function is available which controls how much time is covered by the timeline window.

Dragging a suitably compressed Replay file into the Play window will display its first frame. At the bottom of both the display windows is the *shuttle*, which controls the speed and direction of playback for the file. It allows you to swiftly and accurately locate specific sequences in the recording.

The outer icons at either end of the shuttle go to the start and end of the source – the end always has a dummy frame added which is marked with spirals top and bottom. The inner pair move the shuttle to the previous or next edit point.

Edits are made up of *in* and *out* points. The former is the point where a clip will start, the other is where it ends – sensible really. You mark the start and end of the clip you want in Play, and then drag the *window* into Record. The clip is added at the position of the currently displayed frame.

If it's the dummy end frame, the new clip is just added on. However, if the insertion point is in the middle somewhere, a special FX window appears which allows you to *insert* the clip, overlay it, or perform a mix or wipe from one to the other – if it's video that's being transferred.

The mixes and wipes can have their individual parameters modified to speed them up and slow them down, emphasising one image over the other until the fade is complete. The duration of the effect can be modified by hand, specified in standard timecode format.

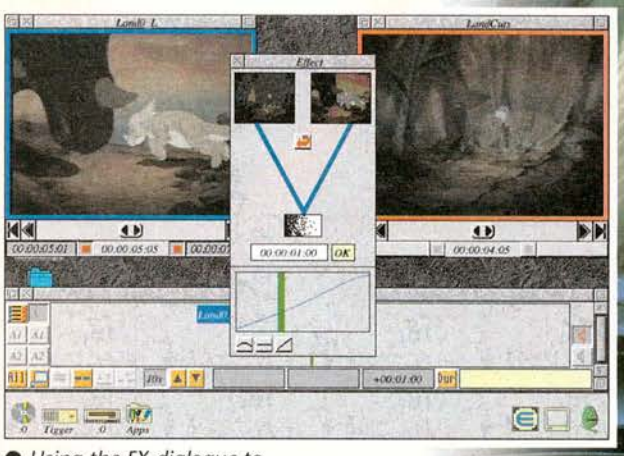
The in and out points can be *trimmed* by direct dragging on the timeline, so with the right level of zoom the edit can be adjusted dynamically and precisely.

The Record window also has the ability to set in and out points, but their effect is slightly different. The new source starts at the in point regardless of which frame is being displayed, and stops as soon as the out point is reached. This can be used to prevent the new clip from overwriting a section that needs to be preserved.

If you mess about inserting clips here and there it's possible that sound may get out of synchronisation with the video. If they come from different sources, it's possible to force tracks to be synced. Audio and video which are from the same source are automatically synced.

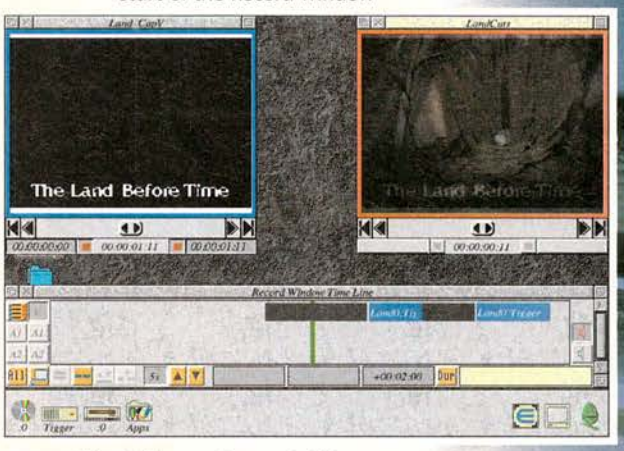
Audio itself has its own special window which controls the overall sound level of the chosen channel. It can be adjusted from frame to frame and then smoothed if required. Because there are two channels, you can perform tricks like having music in the foreground and temporarily reducing its volume to allow spoken words to become comprehensible.

There are three types of save that can be performed. First is the log file. This records any edits and the files they come from. It's the decision list for the Record window. You can also save log files for the source files. This can be useful if you've set up edit points that you want to preserve for later use.



● *Using the FX dialogue to alter the fade parameters*

● *Adding a drawfile caption with a two second fade into the start of the Record window*



Log files hold the actual path and filename of the source files so they mustn't be moved on the hard disk. Although the log files can go anywhere, I think an optional relative path would have been useful.

You can save as a Replay file. This isn't particularly useful from the Play window, but when performed from Record it creates the final cut with all the mixes, fades, sounds and so on. The result is the Replay file you put together. It can take quite a while to do this, depending on how many effects you employed and the overall length. You can also save the currently displayed frame as a sprite.

Cut and paste operations are available, plus the ability to close up any gaps created either by simply removing it or by extending one of the edits that enclose it.

Adding captions or freeze frames ➤

● *A frame from the final cut showing the incorrect drawfile shape at the top and bottom*

● *Another frame from the final cut showing two clips mid-fade*

➤

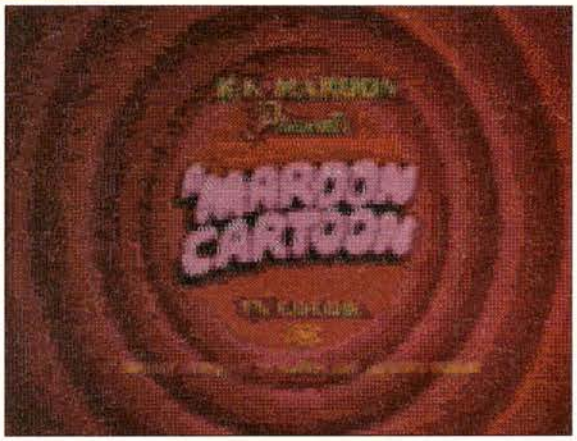
is a popular feature, and Eidoscope provides special tools to do it. You can simply drag a drawfile or a sprite on to the Play window. You are then asked for how long – how many frames – you want the image to last. The program creates that number of frames of the single image.

You can then cut it into the Record window in anyway you choose. For example, I added the title, *The Land Before Time* to my file. Initially I created a drawfile with black text, but this came out as black on white in the frame, which didn't fade well into the video.

I replaced it with white text on a black box, but unless this is exactly the right proportions – mine wasn't – it can result in gaps at the top or right. Perhaps Eidos could provide either a template or allow the file to be scaled into the window. Another point to note is that the ESCaPE image is quite low, and at fixed pixel resolution, the text came out rather blocky. Still, it gives an idea of what can be achieved.

Freeze frames couldn't be easier – save a sprite from the Record window into Play, specify how long it should be frozen for, and cut it back into Record.

For ease of working, most of the operations can be controlled with key presses. But because of the short time I played with the program, I'm not sure how useful these really are. However, I was happy with the mouse in this highly visually based environment and subject.



● *Frames from my cut of the Roger Rabbit intro cartoon*

Summing up

The program is very easy to use as long as you have the memory to work in. 4Mb is given as the minimum, but I found it unworkable for files over a certain length – it wouldn't play-back for me.

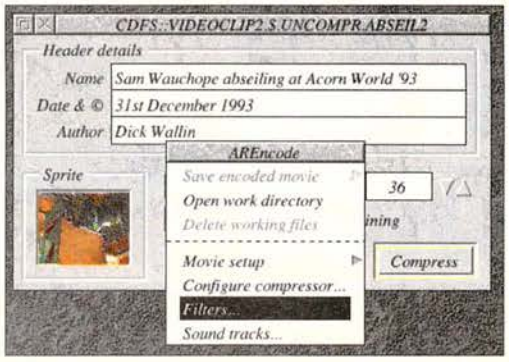
Eidos protect the software with a key disk system, but I really can't understand why – the hardware requirements of the system (Risc PC, 8Mb, masses of hard disk, Eagle M2) are effectively a dongle. In this case, I believe a system such as the Digital Services method, requiring the new owner to ring the company for the unlocking code but simultaneously acting as registration for the software, would be much more appropriate.

The software itself is excellent.

RCompress

The Eagle M2 comes with an application called RCompress which is the equivalent of the Acorn AREncode program. It performs the same task as AREncode, being a front-end to the compression software in ARMovie, but has fewer options – lacking the filters, for example.

Play that again



● *The main control window from AREncode*

THE Replay Starter Kit came in like a lamb. No magazine received any form of press release about it, and we had to fight to get hold of a copy, despite the fact that it's a proper Acorn product complete with the usual high-quality slip box. We'd like to thank the programmer of the system for lending us his personal copy.

The package consists of a floppy disk with an upgrade for the ARMovie and ARPlayer applications, plus AREncode, which will compress an uncompressed Replay movie. There's also a CD-Rom with piles of Replay movies on it, plus some uncompressed ones to practice on.

There are two manuals – both produced to the usual high Acorn standard. One is the User Guide for the supplied programs, the other contains advice on how to create Multimedia applications.

Most people are familiar with ARPlayer even if it's only to play some short video sequence from disk, but the manual gives a detailed description of all its features including using the new Shape and Trajectory options, and how to get the best from the *extraction* facilities.

Next up is the AREncode program. Essentially this takes an uncompressed Replay file which may be created by the Eagle M2 card, Irlam Replay DIY card, Empire, Rephorm and Morpheus programs, and converts it into a compressed Replay file.

AREncode uses any Replay Type 1 compression system – the default ones being Moving Lines and Moving Blocks – but any other Type 1 compressor that's added will appear in the menu.

The options available are extensive, from specifying the header text and initial display sprite – whether to multi-task or not – and what screen mode to use when compressing, to fine-tuning such as whether to alter the frame rate, choosing the compressor and all the associated compressor options, and whether to apply one or more filters to the image for sharpening or blurring. Also, you can specify which soundtracks to include, and they may come from separate files.

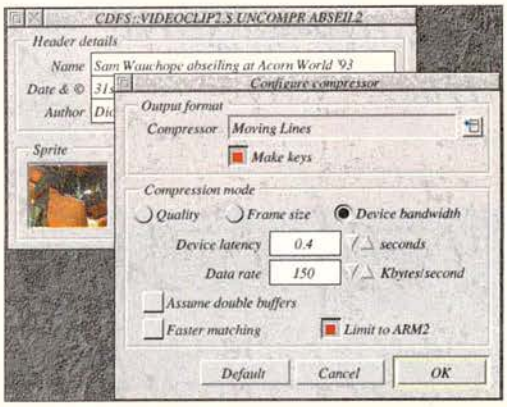
The kind of compressor options you can select include limiting the system to ARM2, to ensure the slower machine can display the movie without trouble. Including complete key frames which restart the compression sequence, this has several effects: It allows the movie to be started from points within the file rather than just the beginning, but it makes the overall file larger.

You can alter the overall quality setting – zero is highest while 99 is lowest. However, the amount of memory needed to compress varies with the quality – higher quality = more memory. The compressor may actually keep retrying compression at lower and lower quality if it can't compress with the given memory.

There are several filters supplied for smoothing or sharpening the image, ignoring differences between frames. You can add one or more filters in any order, as well as apply them more than once.

The compression process can take a very long time so it's worth setting up to run overnight or longer.

Chapter Four of the User Guide gives detailed instructions on how to write Replay-compliant applications, complete with all the interesting parameters you can add to the command that runs the movie. The appendices include a detailed description of a Replay file structure.



● *Refining control of the compressor*

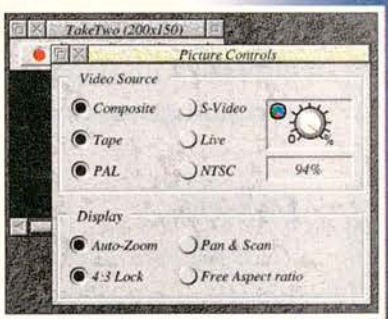
The *Desktop Media Guide* that comes with the pack is an 80 page booklet that provides advice on producing your own multimedia applications. It's based on the experience of the managers of the Horizon Project.

It's very well written, and the chapters cover areas such as planning and design, multimedia, hard and software resources, a practical example of a school prospectus with appendices on copyright, sources, the various Acorn multimedia authoring packages, publishing an application on CD-Rom, style guidance and a glossary.

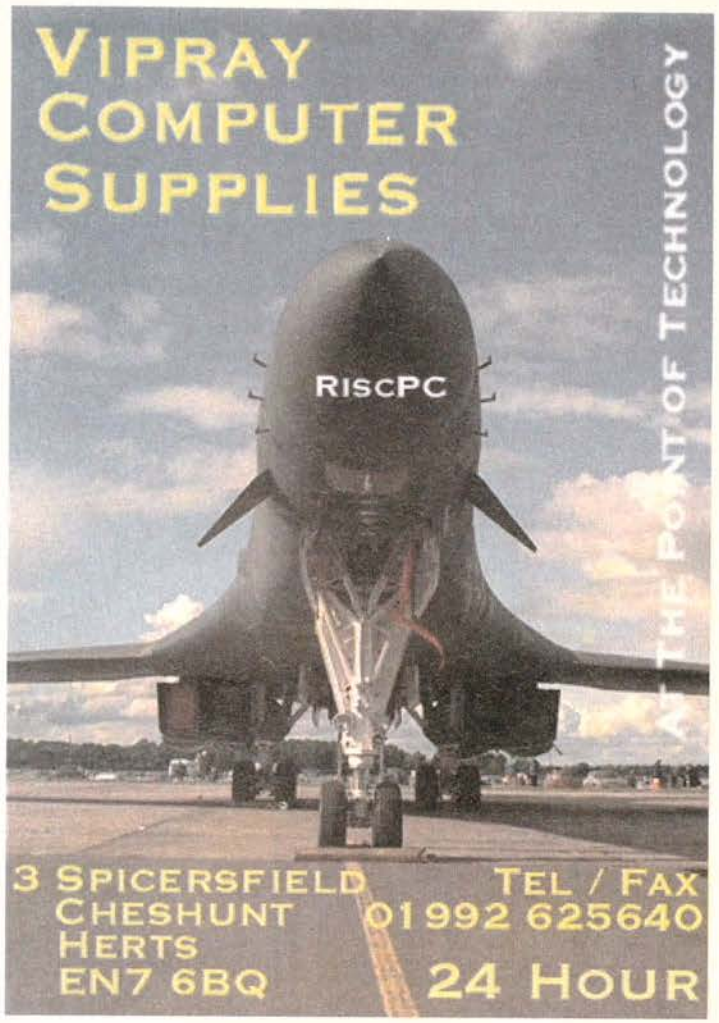
The Replay Starter Kit is a strange beast, incorporating elements for both a multimedia project manager and the multimedia programmer. Both sections are excellent quality, but for the most part I would think they are mutually exclusive.

PRODUCT SPOTLIGHT

Product: Replay Starter Kit
Price: £41.07 (inc VAT)
Supplier: Acorn Computers Ltd
Tel: 01223 254254
Requirements: Eagle M2 card or Irlam Replay DIY, lots of hard disk space



● *The input options for Take Two, the Eagle M2 software*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C++ the language of the future?

Steve Mumford introduces you to the son of C

THERE are many different programming languages in existence, each with their own specific functions – from Basic, Pascal, Cobol and Lisp to Ada, Fortran, and of course C. Due to its nature, C is both suitable for handling low-level systems work as well as higher level programs, and it's this versatility that has swelled its popularity.

However, it's not easy being perfect, and there was still room for alteration in the language. Its younger brother, C++, came as the result of the quest for *a better C*, to make programming easier and more pleasant – especially when constructing large applications. It evolved as various people made contributions, and the current form is described in Bjarne Stroustrup's book, *The C++ Programming Language*. An ANSI C++ standard is also being drawn up, but this might take a while to reach completion.

Dr. Stroustrup, the original implementor of C++, took his influences from such diverse sources as C, Simula67 and Algol68, among others. The name itself was invented by Rick Mascitti, and resembles an instruction written in C – *take the C language and increment it.*

This article is intended to be a brief introduction to this relatively new language. For those of you who have already dabbled in the mysticisms of ANSI C, I'll run through some of the improved aspects of C++. For those who haven't, I hope you'll finish the article with an understanding of what makes this language attractive to so many programmers.

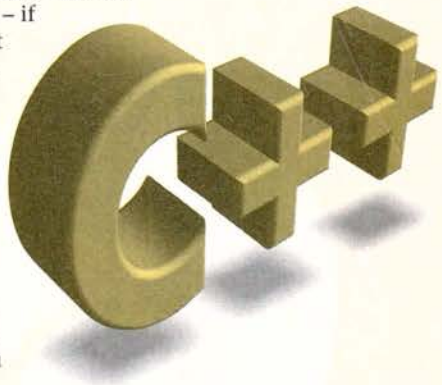
Portability and versatility

Why is C++ such a good language? In the end, it really depends on the type of program you're trying to implement, and to a great extent relies on your personal preferences. But there are reasons why one might choose C++ instead of another.

Portability is a key aspect – it's all very well writing your world-beating pre-emptive accounts package, but fame and fortune will not be yours if it'll only run on your ZX81. Conversion is a costly process if the code is written in a machine-specific language, and although this does occur, it's not particularly economical. The simple act of programming in a universal language cuts through these ties, and allows program conversion to be quick and easy.

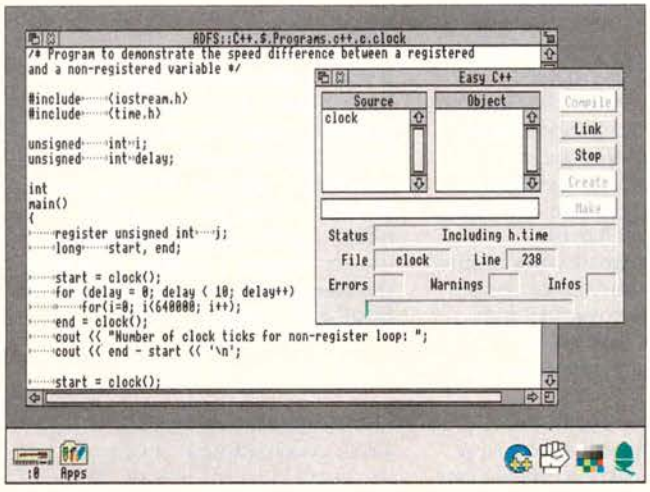
Well, theoretically speaking, (things are never that simple), and a lot of care must be taken to write the code in a portable style to begin with. Because there are C and C++ compilers available for a wide range of machines, it's a good language to use if you intend to transplant your code from one computer to another.

Data handling is another important point – if you wish to write a database to store large volumes of information, it's vital that in the process of coding the storage system, you don't have to bend over backwards – if you're spending most of your time working round inadequacies in the language, you're unlikely to be writing a very efficient program.



Take the simple example where each record of a database must contain a name and an identification number. In Basic, you would probably find yourself having to use two separate arrays – one for each variable type. To reconstitute a whole record, you would have to look at the same element in both arrays.

Copying a record is even worse – each member has to be individually duplicated from whichever array it ➤



● *The Easy C desktop environment*

came from. This leads to a whole mass of variable names hardwired into the code, and is both infuriating and confusing for the programmer.

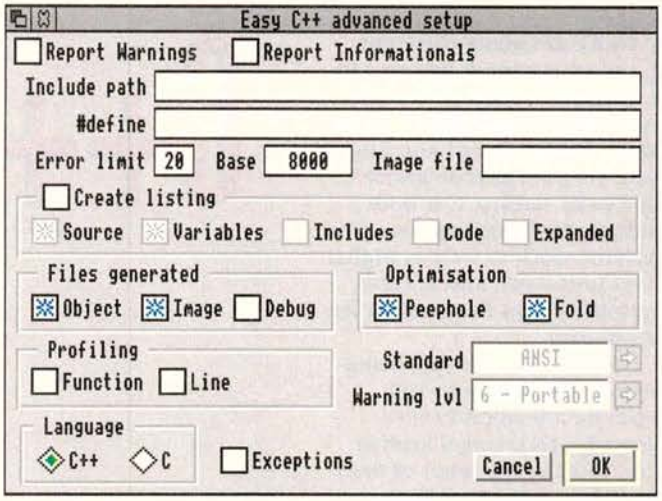
C allows you to build up complex variable types from more simple members, so the above problem would be tackled by defining a new data type and storing within it both the name and the number. Because this can be treated as one variable, it's easy to access, and the task of copying between records can then be carried out in a single operation. This technique also allows you to create more unusual constructions such as data trees or linked lists – although these may be simulated in Basic, they would soak up a disproportionately large amount of programming time.

C++ takes this idea of data versatility and refines it further, introducing the concept of classes. These lead to the wondrous topic of object-oriented programming – the major feature of the new language, and the next topic.

The art of orientation

The phrase *object oriented programming* has been used in abundance by the computer press, but what does it actually mean? Well, it describes a technique of program construction – a method of creating an application in a structured manner.

Anyone who has pottered around with Basic will know that it's a fairly structured language – if you use procedures properly, your program becomes easier to follow and manage. Compare that with a listing full of GOTOs and GOSUBs, and it's evident that the use of procedures allows larger, more complex programs to be written with no extra outlay of effort.



● *Getting ready*

However, even the structural programming introduced by the use of procedures has its limits, and as application size increased, another form of program design was needed – this evolved from the *black box* data structures present in C. As described above, a structure takes many different but related variables, and groups them together in one unit, reducing their complexity in the process.

C++ has a new data type called a *class*. It acts a little like a separate program and hides all its data and routines from the rest of your application, only providing carefully controlled information access points. Why go to all this trouble?

Well, because the interface between the program and the environment it works in is tightly managed and the outer section has no knowledge of what occurs in the inner one. Once you've written the hidden routine, you can forget about its internal workings and concentrate on the main program.

This is important in the commercial environment because the individual program chunks can be written by separate people, and none of them need have detailed knowledge of what the others are doing. This makes it much easier for a corporation to produce large software applications.

As an example, you might want to write a custom stack routine to store lists of variables. C++ allows you to define your stack, including all the data and functions that go along with it, as a class. From then on, whenever you need to use a new stack, all that is required is to define a new variable of that particular class type – it's initialised and ready to go in one statement. As you might imagine, hiding the complexity of such routines can make the programmer's task much easier, and can open the door to larger programs and shorter development times.

These program segments are known as **objects**, and the process of creating your main application from individual *programettes* is termed **object-oriented programming**. So now you know.

Hello, C++

If you've ever been taught C, it's highly likely that one of the first files you compiled was the fabled *Hello World* program – a good example of the sort of thing you're driven to when the compiler's refusing to cooperate. All the code does is to print a suitable phrase to the screen, using a statement of the form shown here:

```
printf("Hello, World!\n");
```

The \n means *new line*. It's also a good example of one of the improvements in C++. A

new operator has been defined which takes the argument that follows it and copies it to the one before.

```
cout << "Hello World in C++!\n";
```

The *put to* operator is the double-arrow nestling in the midst of the statement, and in this case it copies the phrase, complete with the newline character *\n*, to the standard output stream *cout* defined in a C++ library. If you're wondering where your text goes, the standard output is directed to the screen, so this statement is identical in operation to the one above.

This may not seem so exciting at first, but there's a subtle difference. With the printf command, a format string has to be included, which effectively tells the function what it is about to print:

```
printf("The answer you seek is: %d\
n", x*y);
```

The %d tells the function to look at the argument following the format string and attempt to print it as a decimal number. If the value of x*y was not a decimal, the compiler would get upset and produce all manner of error messages.

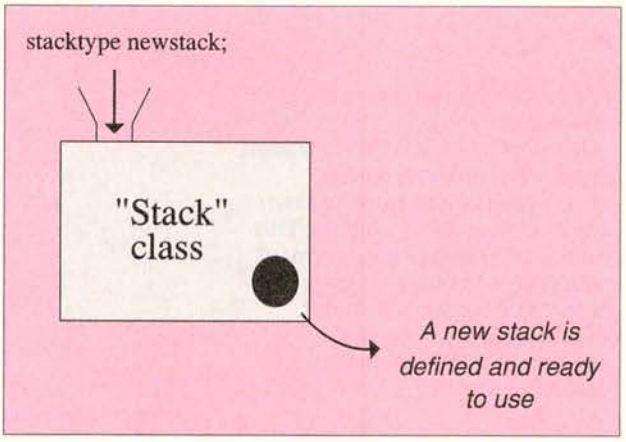
The equivalent statement in C++ would be:

```
cout << "The answer you seek is: "
<< x*y << '\n';
```

The *put to* operators work in series, starting from the right. The newline character is copied on to the result of x*y, and this is tacked on to the string. Once this is completed, the whole lot is sent to the screen to be displayed. The point to note here is that you don't need to tell the operator what sort of variables you're sending – it'll figure that out on its own.

The double-arrow symbol actually has more than one meaning, and in the right circumstances it will act as a bitwise left shift operator. This is a result of another major addition to C++ – it gives you the power to redefine certain common operators and write special functions for them. In this case, the double arrow has been given another meaning for when a bitwise shift isn't appropriate – that of copying whatever's on the right of it to whatever's on the left.

This is an example of *overloading* – this painful procedure describes the process of writing several related functions, where only one is relevant to the type of the variables it's called with. However, instead of having to give each function a different name and manually deciding which one you must call in order to match the variables you're sending it, they all share the same identifier. Far from driving the compiler into a fit of apoplectic rage, this will allow it to look at your code and pick the relevant function from the ones you have included.

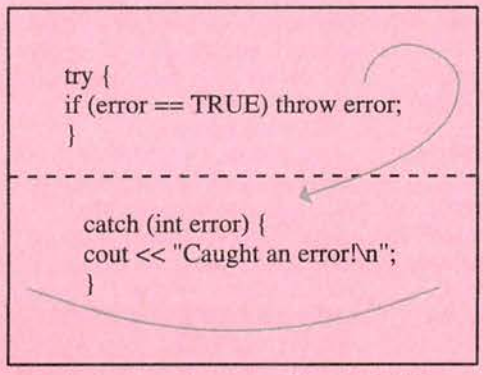


However, it doesn't stop there – the forthcoming ANSI C++ standard allows for templates. These are generic functions that the compiler can adapt in order to accept different combinations of data. For instance, a function could be written in such a way so it would swap any type of variables it was passed, and the compiler would create and overload those functions wherever necessary. Although templates have their limitations, they can usefully reduce the amount of work a programmer has to do.

You throw, I'll catch

One aspect of C that was particularly troublesome was its concept of error handling. Most of the time, it didn't. This is all very well if your program is as good as gold, but as soon as something unexpected happens, you can get some particularly spectacular death sequences as your code winds itself into oblivion. Although this can be enjoyable to watch, especially if you're not the programmer, it's not a feature that many people would choose.

However, with the advent of the draft version of ANSI C++, a new function is to be implemented – that of exception handling. Essentially, it allows you to string a safety net under sensitive parts of your program, and catch any odd ➤

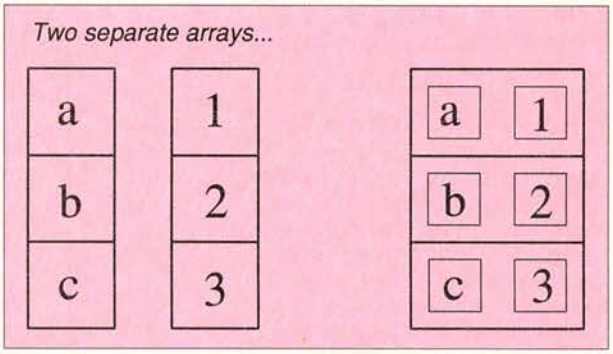


Using exception handling to build a safety net for your program

➤

results that are *dropped* by the code in question.

It's a little like a *switch* statement in construction, and special functions take it in turns to catch variables that they recognise. This technique is a huge improvement on having to build your own error handling from scratch, and it should make the lives of C programmers that bit more bearable.



Getting started

If you'd like to begin coding in C++, there are various ways in which you can make a start. Most importantly, you'll need to find a good reference book – *C++ from the Ground Up* by Herbert Schildt explains the language clearly, and is suitable for both those who understand C, and those who are completely new to the language. For a more advanced text, *The C++ Programming Language* by Bjarne Stroustrup contains a complete description of the language, but can be slightly hard to follow in places.

After you've got your book, all you need now is the compiler. If you have access to the educational national software archive, HENSA, you could spend some quality time downloading all the various fragments of the GNU C++ compiler – this isn't a task to be taken lightly and unless you have a hard disk and at least 4Mb of memory, you're unlikely to get very far.

Although the product has been converted well, it strikes me as being more than a little cumbersome, and the compiled code it produces is somewhat portly. However, and here's the good news, the package is free.

If you're planning to program more seriously, then I would suggest taking a look at one of the commercial compilers on the market. Currently, the only one available is marketed by Risc Developments (01727 840303), and it's an enhancement of their existing Easy C package. Acorn has a version in development as well but there were no further details as we went to press.

I'm always a touch suspicious when a piece of software claims to be *easy*, but I was both astonished and delighted to discover that Easy C++ lives up to its title – after having to struggle with virtual memory managers in order to get the GNU compiler to work, the simplicity of Easy C++ was much appreciated. Although not the ideal software development machine, my 2Mb A3010 coped admirably, leaving me all the more time to work with my source code.

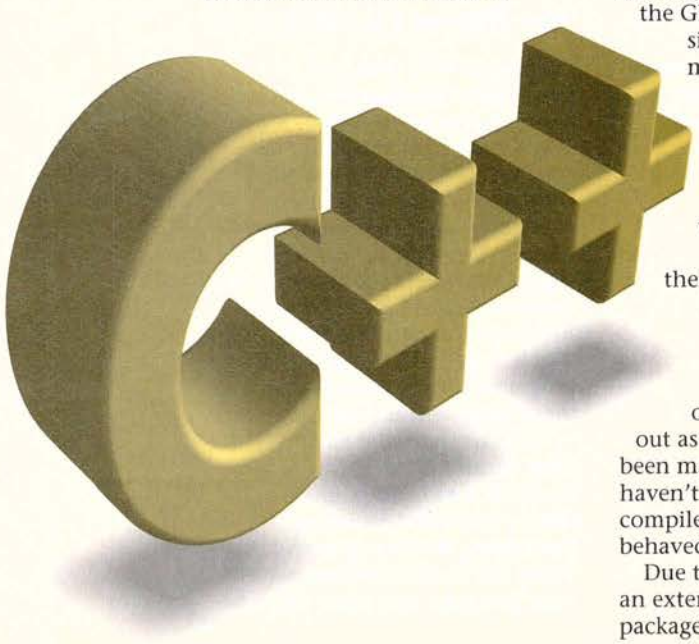
At the time of writing, there were a handful of things left to implement, including the C++ version of their step-by-step debugger, but full versions of the package will be sent out as soon as the additions have been made. I must admit that I haven't had the time to push the compiler as hard as I'd like, but it's behaved itself so far.

Due to the fact that Easy C++ is an extension to an existing package, you still have access to most of the old functions – if you need to compile a program in ANSI C for compatibility reasons, then changing an option in the setup window will allow you to use the old compiler, and no other programs have to be loaded. Automatic linking is supported, along with a simple *makefile* system to allow the compilation of more complicated, modular programs to be simplified.

If you're interested in writing desktop programs, Easy C++ is supplied with various routines and utilities to make your life easier. Unfortunately, as soon as you use any RISC OS specific functions, the code is no longer easily portable, but it's a reasonable price to pay for being able to access the GUI that we all know and love.

Easy C++ is an impressive package, and the simplicity of its use should help programmers new to the language to get started quickly and painlessly. I'm also delighted to see that the application caters for those aspiring coders with low-end machines – it's no fun at all disk-swapping your way through a compilation only to find that you've missed out a semi-colon. Congratulations to Risc Developments for a well-designed product, and here's hoping that it will successfully plug the language gap in the Acorn market.

Is C++ the future of programming? Well, each problem requires a different solution, so C++ isn't going to be perfect for everything. However, its tremendous versatility combined with its object-oriented design is making it very popular in the commercial market, and if you want to get ahead in that sphere then it's a particularly good language to learn. I'm certainly pleased that I'm in on the act.



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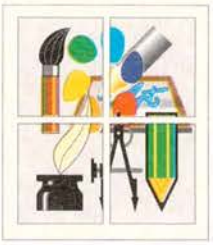

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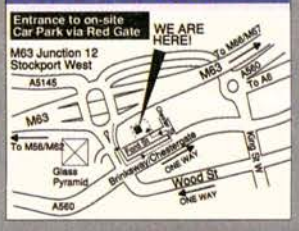

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Don't forget

In the second part of his series Mark Smith examines the memory management in Acorn 32-bit machines

THE BBC Micro Model B had a 64k memory map of which the first 32k was ram and the second 32k was rom. The ram was split up into sections used for specific purposes – language workspace, filing system workspace, stack, input buffer and so on. This was a very simple arrangement with the 32k block of ram always present in the memory map in exactly the same place.

So why have Memory Management? There is one major problem with the BBC Micro approach – that the sections allocated to specific purposes are, in many cases, of a fixed length, even though in some cases that amount may be too much, so memory is wasted, or too little.

A multi-tasking operating system such as RISC OS needs to provide memory to different tasks in such a way that the amount of ram allocated to each can easily be changed. It also needs to be able to give ram, on-the-fly, to *dynamic areas*. These include a ram disk, the relocatable module area (RMA), the system sprite area and so on.

The purpose of the memory management system in an Acorn machine is to dynamically allocate ram to specific purposes as and when it is required.

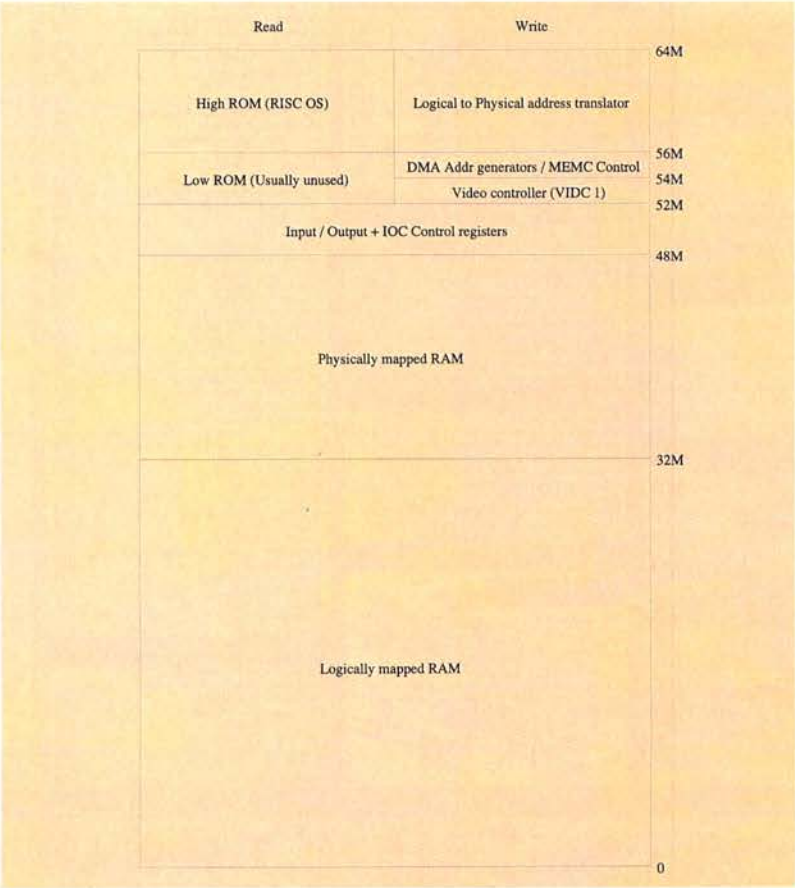


Figure I: Memory map as decoded by MEMC

MEMC, The ARM Memory Controller

The chip that I shall be concentrating on this month is MEMC. This is effectively an interface between the ARM processor and other devices in the Archimedes range of computers, in particular the memory – ram and rom. The MEMC chip performs a number of functions including logical to physical address translation, dynamic ram control, DMA (Direct Memory Access) control and rom access timing, each of which is described in more detail below.

As I mentioned last month, the Archimedes – as opposed to the Risc PC – has a 64Mb memory map. MEMC divides this into the regions shown in Figure I. The ram that you have fitted in the machine is mapped at 32Mb upwards as one block. In fact if you have less than 16Mb, the block is repeated to fill the address space between 32Mb and 48Mb, so if you have a 4Mb machine, it is repeated four times. Because the ram is always mapped into this space in exactly the same way, it is known as Physically Mapped Ram.

There are also areas in the memory map assigned to I/O Controllers – for talking to the outside world – talking to the video controller, rom and controlling various aspects of MEMC itself.

In order to be able to dynamically

allocate ram to specific purposes as and when it is required, the memory is divided up into a number of physical pages. On the Archimedes the size of these pages depends on the amount of memory present in the machine. For machines with 1, 2 or 4Mb of ram, there are always 128 pages of physical ram, so the page sizes are 8k, 16k or 32k respectively. The Logically Mapped Ram area in the memory map is also divided up into pages of the same size – these are known as logical pages.

In addition, this region is divided up by the operating system into areas. Each area is assigned to a specific purpose. For example, the area between 32k and 16Mb is assigned to the currently active desktop task, the ram disk lies between 16Mb and 20Mb, and so on, see Figure II. Ram is mapped into an area when it is required, simply by allocating the required number of physical ram pages to the appropriate logical pages at the start of the area.

For example, if you have a machine with an 8k page size and wish to have an 80k ram disk, then 10 pages of physical ram are allocated to the first 10 logical pages

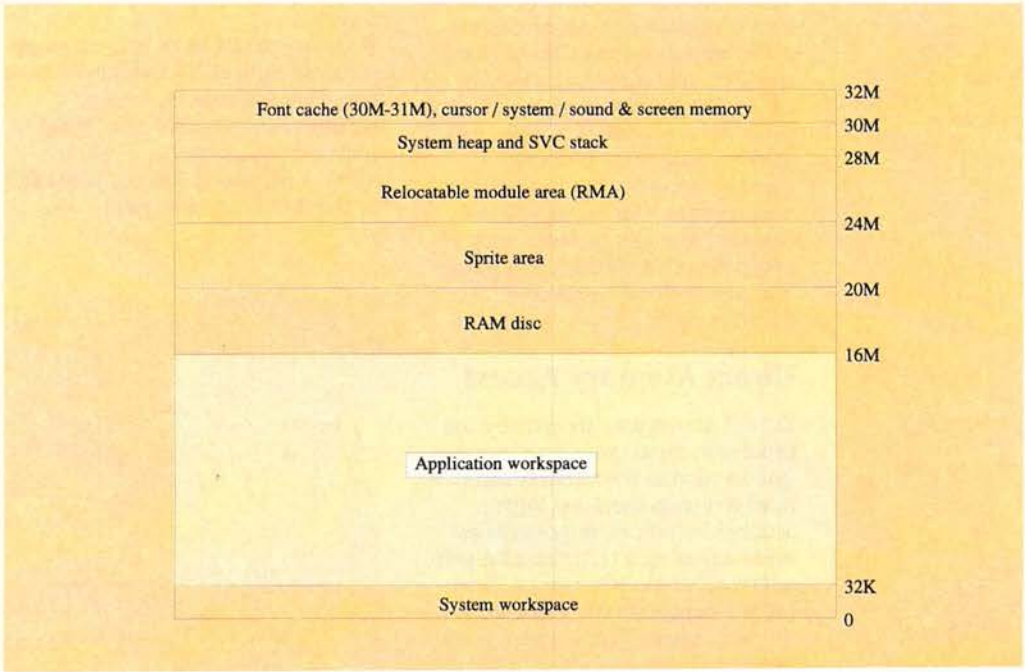
The process of working out which Physical ram page is referred to by an address in the Logically Mapped ram is called Logical to Physical Address Translation. Physical pages are mapped to Logical pages by programming the Logical to Physical Address translator.

Dynamic ram

As I have already mentioned, dynamic ram (dram) is used in preference to static ram (sram), because it is cheaper and much more compact – you can get much higher capacity dram chips than sram ones. There are, however, prices to pay for the use of dram. The first of these, as I mentioned, is that dram tends to be slower, requiring an access time of around 60ns for a fast dram, whereas sram is many times faster.

Secondly, since information is stored as electrical charge, dram also needs to be "refreshed", otherwise the charge leaks away and the dram forgets. Refreshing happens automatically when information is read from the dram, so it is not a problem if information is being read from the dram at regular and short enough intervals. If not, extra refresh cycles may be required.

Dram refresh is handled automatically by MEMC. While a video display is being generated, the dram is accessed regularly enough for video DMA, making dedicated refresh unnecessary. Indeed, because of the way MEMC performs the refresh, it cannot be attempted ➤



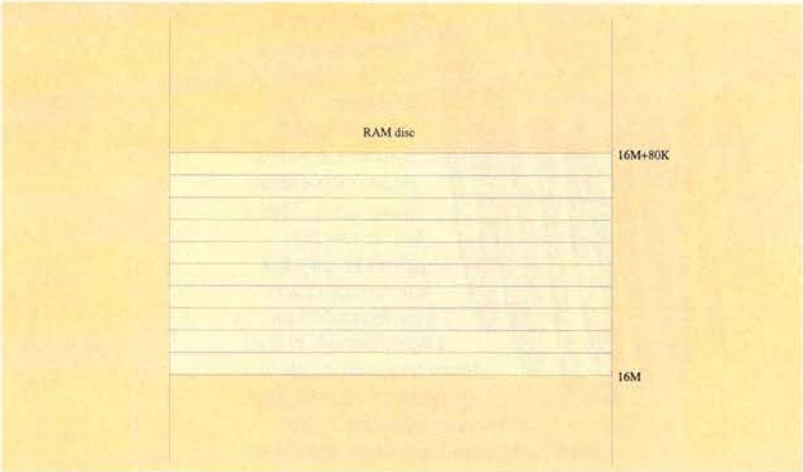


Figure III: An 80k ram disk consisting of 10 x 8k pages

while video data is being output.

However, there is a period when the electron beam flies back from the bottom right of the display to the top left. During this time no video data is being output and, for lower resolution displays, it is long enough for dedicated refresh to be required.

Ram chips are organised as a highly compact grid of memory locations, see Figure IV. In order to read from or write to a ram, a column and a row address must be supplied. This requires one clock cycle to strobe a row address into the ram, followed by a second clock cycle to strobe in a column address. This is called a non-sequential (N-cycle) memory access. In order to speed up subsequent accesses to consecutive memory addresses with the same row address, MEMC can perform sequential (S-cycle) memory accesses that only supply a new column address. In addition, the processor can perform internal cycles (I-cycles) when it is working and does not need to access memory.

Direct Memory Access

As well as memory accesses by the processor, other components in the system such as the video controller need to access memory. Such accesses by other components are achieved using a technique known as Direct Memory Access or DMA. MEMC supports only video (screen display), sound, and cursor (mouse memory, MEMC must arbitrate between the two and decide which gets access at any moment in time. The rules that MEMC uses are as follows:

- DMA operations must wait until any processor memory access in progress is complete.
- In order to preserve the speed advantage gained by using S-cycles, DMA operations are not allowed to proceed if the processor is about to perform an S-cycle.
- In order to minimize the worst-case response delay to DMA requests – so-called DMA latency – the maximum number of consecutive S-cycles is restricted to three. The next memory access will always be an N-cycle.
- DMA operations always read four 32 bit words (16 bytes) from memory at a time. This is done as one N-cycle followed by three S-cycles.
- The processor must wait to access memory until all 16 bytes have been transferred. However, it may perform I-cycles while the DMA transfer is in progress.

DMA support in MEMC is limited to the first 512k of physical ram. With 32k of this reserved for sound and cursor DMA, a maximum of 480k is left for screen memory, hence you cannot have a screen display which uses more than 480k of memory in pre-Risc PC machines.

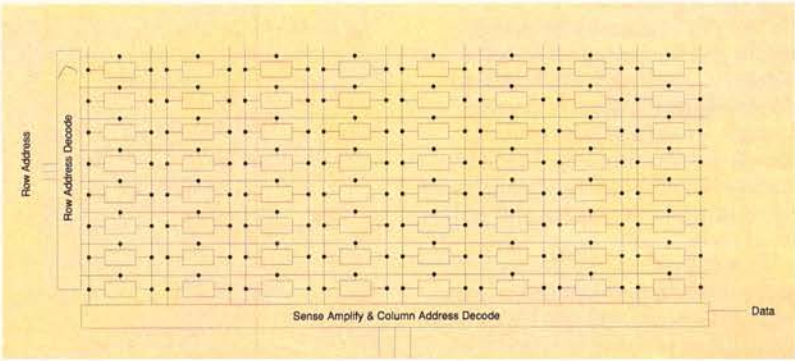
Rom accesses

The minimum access time of a rom chip is generally much longer than that of a ram chip, typically in the region of 200-300ns. For this reason the computer can be speeded up by transferring key modules in the operating system from rom to ram using the command *RMFaster. The speed up can be significant on machines which don't have a processor cache, those with an ARM2 or ARM250.

When accessing rom, MEMC will automatically slow down the access by stretching the processor clock signals. The rom access time can be set by programming a control register.

Next month

In the next issue I will be turning my attention to the video display and, among other things, will explain some of the technical terms used to describe the picture that you get on your monitor.



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Sexism and the gamesplayer

Michael Rozdoba surveys the situation

AFTER last month's frivolous intro, I thought I'd consider a more serious subject this issue. Okay, so this column is supposed to be about programming, but a vital part of programming is design. And to get that right you have to talk to the end users, so this month I want to start by asking for some help from potential gamesplayers.

I write a variety of programs, frequently for my own use, from simple games to spectacular desktop monoliths, and I use all kinds of software from other individuals and companies. But, I don't play commercial games much. They usually involve formulaic repetitive actions and are based around a linear plot which frequently requires either an enthusiasm for mass slaughter or the mentality of a train spotter with a passion for collecting the useless.

The lack of imagination shown in their design, and their use of violent and sexist imagery may well be cause for concern in itself, but I personally don't bother with this junk because it all bores me rigid.

Not that I have anything intrinsically against the playing of games. In fact I have recently been toying with several hopefully novel ideas for new games.

In the end, I decided I ought to find out what the average potential gamesplayer would like – especially those that currently avoid games or even computers altogether. If you have any suggestions, or know of anyone who might, please talk to them and get in touch with me via the usual address. Since the arcades and games shops usually seem to be full of young boys, I'd especially like to hear the views of females, and if you're also a programmer, even better. Let your imagination have full reign, even if your ideas might require computing power which isn't currently available.

Now back to the usual programmer's fare.

Yet more division

The topic of fast assembler division by an arbitrary constant has now been running in TechForum for over six months. Back in the Special 1994 issue we carried the definitive macro implementation by Samuel K. R. Smith. I would now like to issue a new challenge, still on the same subject, to all talented and willing masochists.

Use a previous macro, such as Samuel's, as a guide to writing an ARM code routine dedicated to assembling code fragments for carrying out this rapid division procedure. The routine would be called with two arguments, a divisor and a pointer to a block of memory, and would assemble the required code for that divisor into the block specified. Ideally this should then be embedded within a general purpose division function.

To give you an idea of what I have in mind, it could act along these lines: Rather like the font manager, it would maintain a buffer containing fast division code to handle around 200 divisors. When called, with both numerator and divisor as arguments, it would check to see if it already knows about code for the supplied divisor, and if so, would execute it. Otherwise, the least used divisor's routine is discarded from the buffer and code to support the new divisor assembled and executed.

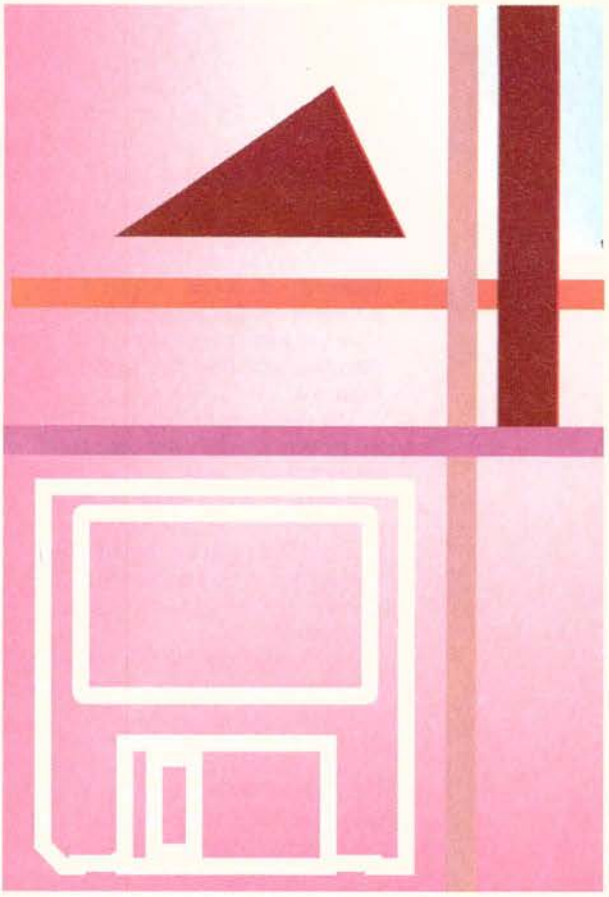
The segment checking to see if the divisor is known would need to be very quick to make this all worthwhile, in comparison with a standard Fourier division algorithm. That shouldn't be too difficult if you optimise for certain conditions. For example, hard code the fragments for certain common constants – ensure the buffer always contains code for certain values, say 1 to 100. In addition, you could make the existence check rapid for the last registered divisor.

The efficiency of such a division function is best illustrated by an example. Suppose a calling routine needs to execute a loop involving repeated division by a certain value. On the first call the division routine will assemble, remember and execute the required code, perhaps taking about three times as long as a

Repeating !Alarms

Last time around I mentioned that James Aylett had written in to point out a bug in RISC OS 3.10 !Alarm (v 2.37), re Message_AlarmSet. I can now confirm that the Acorn upgrade to !Alarm (to v 2.61) does indeed cure this problem.

So, if you want to distribute an application which requires the ability to set and receive task alarms within !Alarm, ensure all users of your application know they can get the necessary !Alarm upgrade from their Acorn dealer, along with upgrades to several of the other RISC OS bundled applications.



Fourier routine, while on all subsequent calls within the loop, the now known routine will be executed in around 10% of the time of the Fourier alternative.

Thus with only four calls using the same divisor, relative speed is already better than the Fourier at 121%, while after 40 calls it's at 580%, and after 400 we have 932%, approaching the limit of 1000% – arising from the fact that the buffered code, once calculated, is 10 times faster than a Fourier routine.

Tech info addendum

Incidentally, the item on division in the Special issue, two months ago, failed to include an explanation of the division macro's core routine, despite referring to this information within the main article.

I've included the explanation this month, as a draw file on the MegaDisk, within directory Spc94_Info. Beware – you will need a modicum of mathematical literacy to be able to read it.

Colour printing

Noel Barron – please accept my moderately profuse apologies for taking so long to answer your question. It didn't immediately strike me as a query relevant to programming, but indirectly it is well worth a mention. Noel wants to know how to get the best out of his Hewlett Packard DeskJet 550 C colour printer – well he did, nine months ago.

The printer dumper module numbers which Noel mentioned, listed on page 3-665 of the RISC OS 3 PRM, are registration numbers for printer dumper module types. They don't necessarily refer to Acorn supplied modules bundled with !Printers, but will also be allocated to third parties wishing to provide drivers which integrate with !Printers.

Thus they don't imply !Printers comes with a Colour Deskjet printer dumper, but you should find that the LaserJet compatible module is usable with an HP DeskJet printer.

The first thing you need to do Noel, is ensure that you have the latest version of Acorn's !Printers, now at v 1.24. This should be widely available. At the very least, you need version 1.22. It offers far better colour support. Previously !Printers could only handle colour printing using 256 colours. The new version allows use of full 24 bit colour. You'll find it comes with several HP drivers, including one for the DeskJet 550C. Hopefully this will give you much improved results.

Failing that, you could always invest in a Turbo driver from Computer Concepts. I haven't used these myself, but I do use CC's LaserDirect drivers and can vouch for the quality, speed and value for money of their software in general.

Now, I did mention at the outset that this subject is connected with an important note for programmers.

For an application which provides an option to print sprites via the installed printer driver, to be able to exploit !Printers' new 24-bit colour support, the printing application must be coded to comply with a certain requirement. RISC OS 3's !Paint, by way of example, hasn't been written appropriately, and won't give the best possible results, whereas !Draw does behave correctly and can be used to print 24-bit images.

The requirement, which programmers must take note of, concerns the setting up of colour translation tables within the usual print protocol. All such tables, used for sprite plotting, must be set up with ColourTrans *every time* you are given a rectangle to draw within the print loop, and not just at the start of the print job.

In practice, this means re-computing the table immediately before printing the sprite or graphic containing the sprite. This is because a three-pass system is used by the printing loop. Each pass presumably deals with eight bits of one of the red, green or blue components of the image. If you don't comply with this, the image will still print, but will be monochrome when printed using a 24-bit aware printer driver.

Incidentally, the above also explains why !Draw complied with this requirement before it was established as necessary for colour printing. !Draw calculates virtually everything it needs on-the-fly while rendering – this includes how to format text within a text area and, crucially, the translation tables needed by sprites.

The downside to this approach is that it lacks the speed of pre-computing – and storing – certain intermediate data only when essential. For example, re-calculating and remembering how to format text only when it is edited would be much quicker than having to re-evaluate the formatting information every time the text is rendered.

However, from a programmer's point of view, there are obvious benefits to the on-the-fly method – much simpler data structures and greater flexibility and maintainability of the resulting code.

Stop me, buy one!

Don't forget, 42 may be the answer, but we have yet to discover the questions. If you have a question, it is your duty to society to write in, so do it NOW!

To: TechForum,
Acorn Computing,
Media House, Adlington Park,
Macclesfield SK10 4NP.

Pretty poly

Steve Turnbull takes the next step in getting 3D graphics on to the screen

THIS time we have only one small Basic program to deal with, but it needs a lot of careful explaining. Basically all it does is put a polygon on the screen, but that polygon can have a number of rather interesting features.

The easiest polygon to render on to the screen is the triangle – it's possible to make optimisations to the code if you know that every polygon is going to be a triangle, and you can build most shapes out of them. Early 3D vector graphics games often used them.

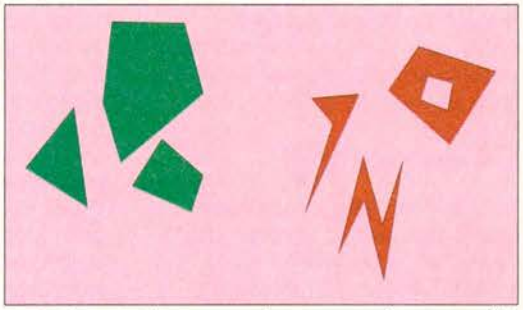
However, they are a bit limiting. The next step is to use *any* convex polygon – Figure I illustrates a number of convex polygons. Again you can optimise various techniques for rendering convex polygons, but that's not the route we're going to take.

Our technique for putting polygons on the screen is called *Scanline conversion* and this month we're going to see how it's used to plot just one polygon – it'll be a couple of articles later before we get to putting up more than one.

In addition, most 3D games use a brute force technique for plotting the polygons: firstly, all the polygons that are outside the field of view are ignored, then all the ones that are facing away from the viewer are discounted. The remaining ones are sorted into their distance from the viewer, furthest first. Then each one is taken in turn and drawn on the screen.

For complex scenes, such as exploding buildings in StarFighter 3000, a particular pixel on the screen may be drawn and redrawn a dozen times. The furthest polygon is drawn, then one nearer covers it up, then another one covers up a section of what's already been plotted and so on.

This is highly inefficient but quite simple. By the way, I'm not suggesting this *is* how the authors of StarFighter 3000 did it, I simply used that as an example of scene complexity with which most people will be familiar. Scanline conversion does it differently.



● *Figure I: The green polygons are all convex while the red ones are different forms of concave polygon*

Scanline conversion

This method of rendering a scene to the screen works by taking each line (row) of pixels on the screen in turn and seeing whether any part of the polygon appears on it, drawing it if it does. Each row is plotted, then we move on to the next row. The idea for this is shown in Figure II.

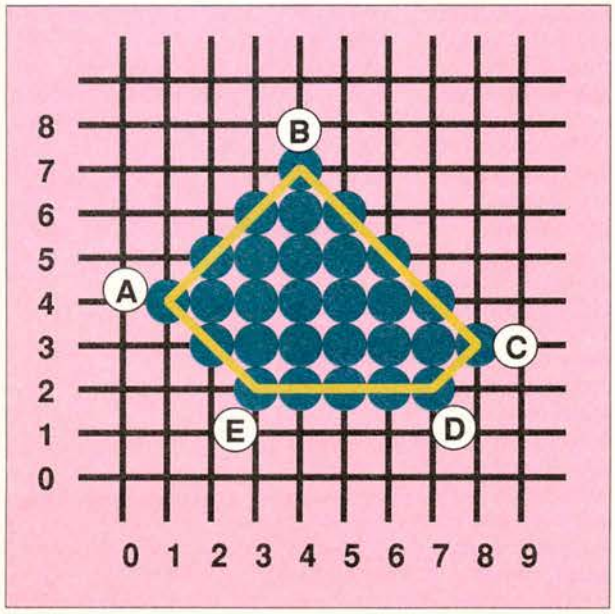
For this we need a table of all the *edges* in the polygon. It doesn't matter what order we process the edges because it all comes out in the wash. So we get a table of edges: AB, BC, CD, EA but not DE. For reasons that will become clear we ignore horizontal edges.

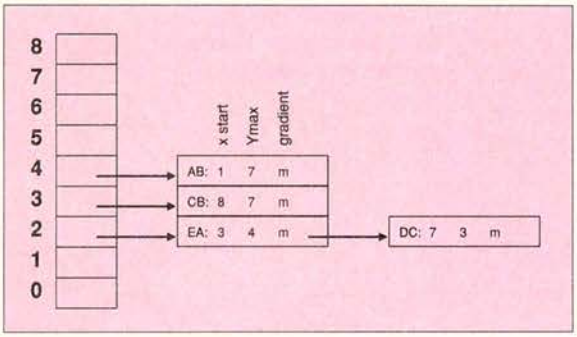
The table takes the form of an array, one entry for each row of the screen, and from each of these entries we get a *linked list* of edges that start on that row. We always work from the lowest row upwards.

Each entry in the linked list contains various bits of information, the x co-ordinate of the start point of the line, the row (Ymax) that the edge stops on, and information about the gradient of the line.

The order of the entries in the Edge Table is *increasing x*, so the first edge will be the one that starts at the leftmost position on the screen and so on. Figure III shows how the Edge Table for the polygon in Figure II would be put together. The gradient information is abbreviated to *m* in

● *Figure II: How scanline converting a polygon works*





● *Figure III: The Edge Table for the polygon in Figure II*

each case although it consists of several values.

The process of rendering involves another linked list, which is officially called the Active Edge Table, although in my code I refer to it as the Active Edge List, which I think is more descriptive. This keeps track of the edges that are active for the current scan line being processed, and contains similar values to the Edge Table entries – it is initialised from there – but it's dynamic, and edges are added or removed as the current scan line is changed.

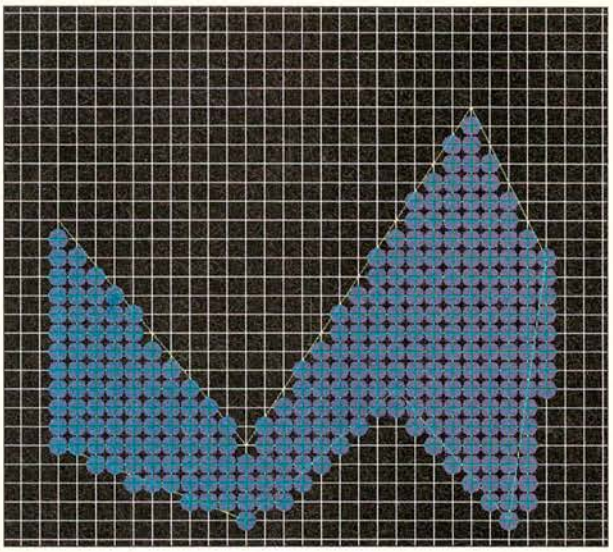
Figure IV shows the content of the Active Edge List at different scan lines, two and five. At scan line five we have incremented the *x* value of the two edges from the their starting values.

From this you should be able to see the trick with scanline conversion: we can take the edge values and draw between them. In fact, regardless of how many edges of the polygon cross this scanline, we just start with an in/out flag – are we *inside* or *outside* the polygon – which is initially set to *out*.

At the first edge we set it to *in* and draw up to the next edge. We then set it to *out* and don't draw to the next edge and so on until we run out of edges. Then we increment the *x* values and the scan line, throw away any edges that end here, add any edges that start on this line and continue.

You can see this approach means we can draw a polygon of any shape, because it doesn't matter to the algorithm how many edges cross the scanline. It will correctly deal with any shape of polygon whether convex or not – and it will easily handle holes in the polygon, something most polygon renderers won't do. It should also handle polygons whose lines cross, although I haven't tested it.

We will be using an extension of this algorithm when we come to draw multiple polygons on the screen – and we'll be able to see through the holes. In fact this type of procedure is also ideal for handling shading algorithms which can make surfaces appear curved.



I should point out that my implementation of this algorithm lacks many of the refinements that should be included for *precision* work.

For example you can see when you run the program on the MegaDisk that some of the pixels stick out beyond the edge of the drawn polygon. This should not happen and there are refinements to the overall procedure that ensure this never happens.

Problems and gradient

The entries in the Active Edge List must always be in *x* order – when it comes to adding new edges from the Edge Table, it's not too hard to insert them in the correct place in the list. However, as we increment the scanline, we also adjust the *current x* value of each entry. It's possible that the entries will become out of order.

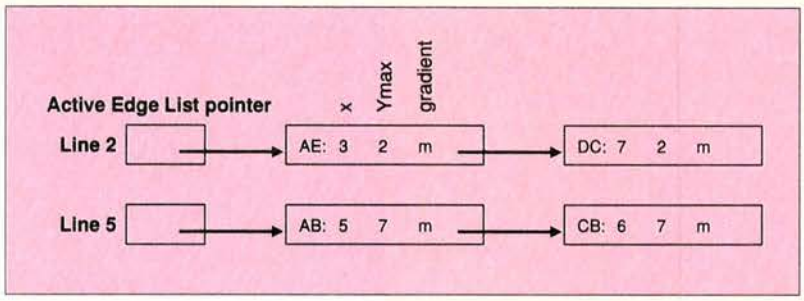
The book (see the panel) uses a one-way linked list (each entry points only to the *next* entry), and suggests sorting the entire list *after* all the increments have been done. However, this is quite inefficient. A much better system is, after an entry has been incremented, to check to see if it ➤

Using Draw

The code for processing lists of entries can get quite involved, especially at the ends of the list where pointers become zero. Testing this sort of code by hand is crucial to avoid the wasted time of machine crashes as the software takes off for locations unknown after hitting a bug.

It's often convenient to draw list entries and pointers on paper but it gets messy as you repeatedly scribble out changing pointer values. However, up to now, this is how I've always done it. It occurred to me this time round that creating the entries as objects in a drawfile and physically moving pointers around is much cleaner and faster. In addition you can backstep using the Undo function.

One thing I *didn't* try, but is a further extension, is to load the code into the drawfile as well and have a line pointer which you can advance, then perform the operation currently pointed to. This would obey the Undo as well which would be very handy.



● *Figure IV: How the Active Edge List looks at scan lines 2 and 5*

➤

is out of order with the entry before it in the list.

If it isn't then just continuewith the next one. But, if it is now in the wrong place – its *x* value is less than the previous entry's – scan back through the list to find the right position and move it. This is achieved using a two-way linked list which allows you to scan the list in both directions, shown in Figure V.

We only have to check with the entries that have already been incremented because, by the time we get to the end of the list, we will have checked every entry and anything that needs to move will be in the right place.

It adds a memory overhead and increases the number of pointers that must be manipulated, but, on the whole, simplifies much of the processing. This is an example of the usual pay-off between memory and processing speed.

As a side note, the idea of using a two-way list and sorting as we go was gleaned from a message in the newsgroup *comp.graphics algorithms* on the Internet.

Now let's look at the problem of calculating the next *x* position of an edge – if you're not interested you can skip this bit and just trust in the fact that it works.

If you can remember your maths, the equation for a line is:

$$y = m.x$$

From this – you can work out the proof yourself if you want – you can get the following relationship:

$$x_{i+1} = x_i + 1/m$$

which means that for the *x* value of a line on any scanline *i*, the value of *x* on the next line, *i+1*, is the current value plus an increment, $1/m$. The trick is to calculate $1/m$ without using any division and only integer numbers.

We do this by calculating then keeping track of the numerator and denominator of the incrementing value, for example:

$$m = \frac{(y_{max} - y_{min})}{(x_{max} - x_{min})}$$

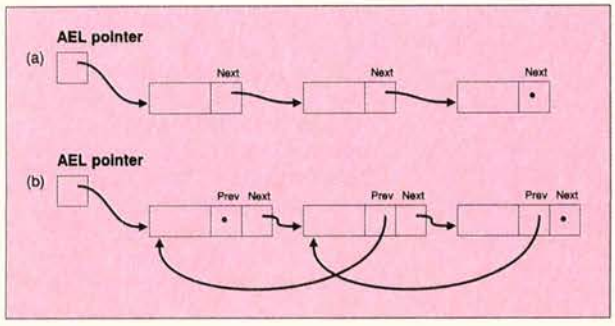
So the numerator is $(y_{max} - y_{min})$ and the denominator is $(x_{max} - x_{min})$. Note that if this is zero the line is vertical, so *x* always stays the same.

We have an incrementing value to which the numerator value is added each time round. If this value exceeds the denominator value it means that *x* has changed. We repeatedly subtract the denominator from the numerator until it's less than the denominator, changing *x* each time. There's a bit of messing around with positives and negatives depending on which way the line slopes, but essentially that's all there is to it.

Having said that, there is considerably more. For example, there's no guarantee that the calculated *x* point lies exactly on a pixel boundary – in fact it probably won't – so it should be decided in which direction the value needs to be rounded. I haven't bothered with this in my implementation which is why the polygon fitting is so crude.

● *Next month we'll be taking our first look at actual objects, how we store them and how to implement multiple versions of the same object most efficiently.*

● *Figure V: The recommended one-way list (a) and the more useful two-way list (b)*



Book club

The ST book I mentioned at the start of these articles provided a good launching pad, but we soon parted company. The best book so far has been *Computer Graphics, Principles and Practice* by Foley, van Dam, Feiner and Hughes, ISBN 0-201-12110-7, with 1174 pages. This monstrous volume contains just about everything you could ever want to know about the subject, and a lot you probably don't want to bother with. But it's got some brilliant pictures.

There is a cut-down version called *Introduction to Computer Graphics* by the same crew plus Phillips, ISBN 0-201-60921-5, with 560 pages. Again it contains material you might not want, but less of it, and it still covers what we do want. It's got fewer of the excellent pictures of its big brother.

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Intensive training

Louise Hand lays it on the land in the puzzle ridden world of adventuring

WITH the recent appearance on the Archimedes of its first true graphic adventure in the *Monkey Island-style* – the excellent *Simon the Sorcerer* – we can probably expect many more. For those of us who started out on the BBC Micro, playing the many great text adventures available for that machine, and for other adventure game fanatics, this is brilliant news. These graphic adventures are very challenging and experience gained playing text games gives you a better chance of success.

In fact, adventures can seem a little strange to the uninitiated, and as for text games – games without any graphics – it seems very boring and simplistic. But, if you like more thought provoking entertainment, adventure games, even text adventures, provide a great challenge. If you're finding new games expensive, there are many good PD adventures available and a number of commercial games can be purchased in value-for-money compilations.

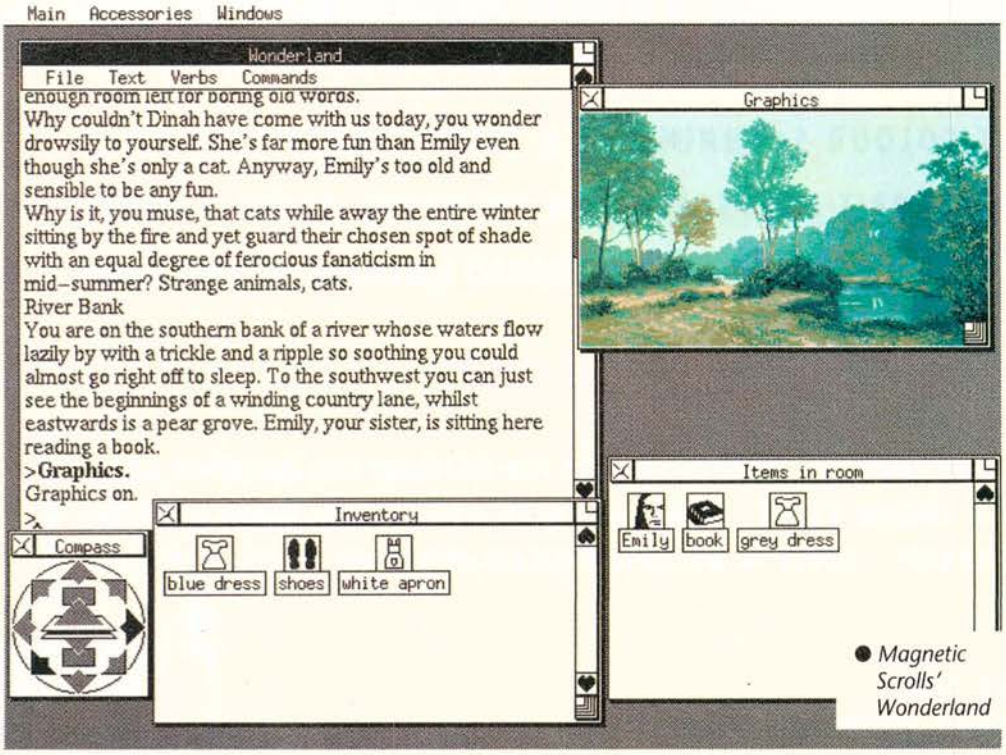
In this article I hope to give you some general tips to get you started. Most of the examples will be from text adventures since true graphic adventures are only just becoming available for the Archimedes, but I will try to give some hints for these too. You'll find that most of the puzzles are solved in a similar way.

The first major problem the novice adventurer will face is getting the game to understand what you want to do. This is far easier in graphic games, where all available commands are selected with the mouse. In text adventures you are faced with a prompt and expected to type a command.

The part of the program which interprets your commands is called the *parser*. Most parsers in early adventure games would only accept simple verb-noun commands such as *take food*, but later games allow you to use quite complex sentences. For example, you can string commands together using *and* or *then*, allowing you to type something like *take the food and drink* or *open the box then take the wand*.

Pronouns such as *he, she, it* and *them* are understood by a number of parsers, and are assumed to refer to the last noun you typed – *unlock the door then open it* would work, but *get hoe, dig garden, drop it* would attempt to drop the garden. You can also use *all* in commands such as *take all* or *drop all* which will affect all immediately visible objects, but will not reveal hidden ones.

It is useful to remember that the majority of adventure games have a common *core* vocabulary. Movement is achieved using the



● *Magnetic Scrolls' Wonderland*

compass directions plus up and down, usually abbreviated to N, S, E, W, NW, NE, SW, SE, U, D. Other common commands are *inventory* (tells you what you are carrying), *look* (repeats the location description), *take, get, drop, open, close, unlock, wear, remove, eat, drink, swim* and so on.

There are some common communication problems which arise in game after game. One such problem is switching on lamps. If *turn on lamp* or *switch on lamp* doesn't work, and *light lamp* has no effect either, then try *lamp on* or even just *on*. The reverse of these commands is usually *turn off lamp, extinguish lamp, lamp off* or *off*.

Communication

Speaking to other characters can sometimes cause difficulties. To use direct speech, the usual format is SAY <speech> to <character name> or type <character name>, followed by what you want to say. Sometimes the speech must be enclosed in speech marks. Some games only allow you to make general enquiries expressed as ASK <character> about <subject>, or even just simply ASK <character> for help or for an object which he/she has in their possession.

When you talk to characters in most graphic adventures you will be given a list of phrases to choose from. The best bet here is to continue talking until you have said everything possible to a character so that you do not miss out on any vital information. Occasionally, however, it may be obvious from the game what you should say to a particular character – or not say for that matter, though it can be fun anyway.

Here is one final communication problem. If you find yourself in a building you don't seem to be able to move out of in the normal way, then try *leave, exit, out* or *go out*. Often the key to a puzzle is finding the right verb. I was stuck for ages trying to get a brick out of a wall with a knife in Magnetic Scrolls' *Wonderland*. I tried *push*ing, *pull*ing even *chip*ping at the mortar, but to no avail. I finally discovered you had to *lever brick with knife*. Try using a thesaurus to find synonyms you might not have thought of.

Problem solving

A good way to approach many problems is to try to imagine what you would do in that situation if you were actually there. Are you carrying out every necessary action? In the same game, *Wonderland*, you have to look through a telescope, but you don't see anything useful unless you look through the telescope with one eye and close the other. You would do this automatically in real life, but it is not so obvious when you have to type in the commands without actually doing the action.

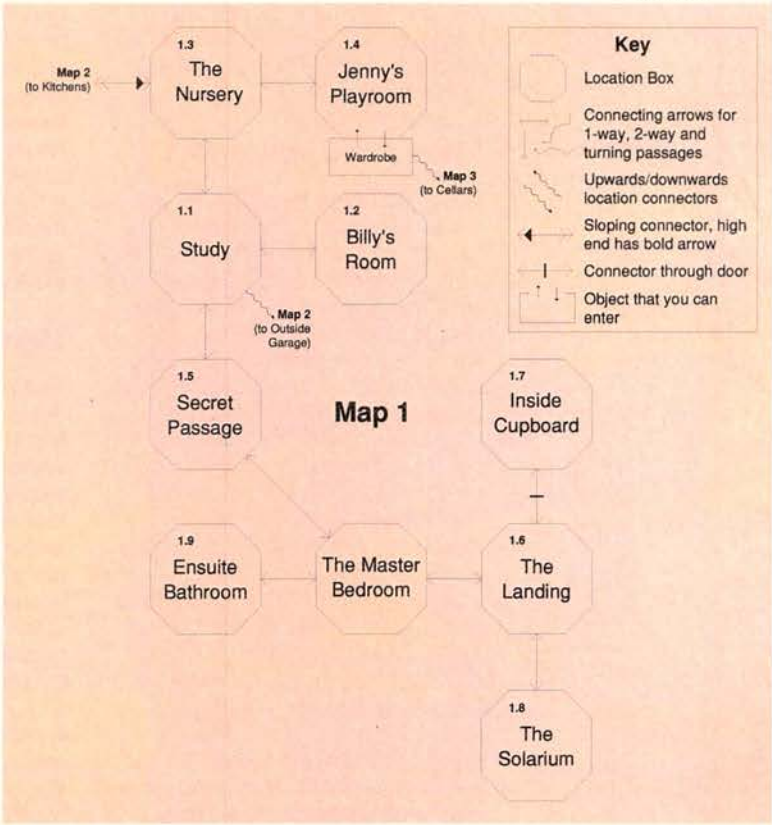
Another general problem-solving technique is observation. In graphic games this means exactly what it says. You have to look carefully at the graphics because sometimes the answer lies in the tiniest details. These are sometimes extremely difficult to spot. In text adventures, and in graphic adventures too, you should *examine* and *search* everything in sight, both objects you can pick up and those mentioned in location descriptions. Some games will allow you to *look in, under* and *behind* scenery to reveal new clues and objects. Also, look out for clues hidden in the location descriptions. An observant adventurer is a successful one.

If you get really stuck you can always type *help*. The response can be anything from 'work it out yourself' to a list of verbs understood by the program or a useful hint. It's worth a try.

Map it

If you are to be successful in adventure games it is vital that you take the time to make maps. There are probably as many mapping systems as there are adventurers, but the one used to produce the map below has been created after years of experimentation and I find that it works well for almost all adventures. Most exits in a game are logical. In other words, if you move north and then south, you will end up back where you started. This sort of exit is indicated by a two-way arrow.

There are three other types of exit shown on this map. An arrow with a line through it indicates a removable obstacle between the two locations. This is usually a door which can be unlocked and opened but it can also mean some other



● *A map of an imaginary adventure*

obstruction such as a boulder which has to be moved. A connector with an open double arrow at one end and a bold double arrow at the other shows a sloping exit.

The east exit from the Nursery in the figure is such an exit. It is described as leading *south and down*. The squiggly arrows indicate exits up or down which lead to the location directly above or below the current one. Both the previous two exits lead to a different level of the map by going either up or down a slope, stairs, trapdoor, lift and so on. Each new level should be drawn on a different map. Write the number of the new map and the name of the location which the exit leads to at the end of the arrow.

Sometimes when you leave a location in one direction, returning in the opposite direction will not take you back to your starting point, but returning in some other direction will. This can be thought of as a twist in the connecting passage. In the example below, moving east from the Cave will take you to the Hall, but moving south from the Hall, not west, will take you back to the Cave. Sometimes the connectors are even longer than this and have more twists. This happens quite often in *Colossal Cave Adventure*, making it quite difficult to map.

Mazes and labyrinths

Mazes are mapped separately, as described below, and can be thought of as a single location, usually with one entrance and one exit. The numbers in the octagons refer to notes on that location which tell you what objects were discovered there and any special features.

The components for this mapping system are included on a Draw file on the disk to allow you to build your own maps easily. This is especially useful with multi-tasking adventure games.

Some of the most difficult puzzles in adventure games are mazes. These are sections of the game where all locations seem the same and where movement is illogical. As you can imagine, it is extremely easy to get completely lost. But they are all possible. I'll describe the two most well-known maze-solving methods to give you the general idea.

Your first task is to discover a method by which you can tell when you have moved to a new location. In some mazes, each location description is slightly different. One location might be *a twisty, turny maze of little passages*, while another might be *a turny, twisty maze of little passages*, and in this way you can tell one location from another. In other mazes all the descriptions are exactly the same. In this case, drop an object in the first location to mark it. If when you move, the object is no longer visible, you are in a new location and should mark it with another object.

The next stage is to map the maze. I find that the easiest way to do this is to draw up a table. Number each location and write the numbers in a column down the left hand-side. Then write all possible compass directions along the top. Start with location one and move in the first direction in the list. Write the number of the location in which you find yourself in the appropriate place in the table, in this case the top left space.

You can see from the map on the opposite page that moving east from location two, the pink gloves, will take you to location four, the hoe, and moving north from location four will take you to location three, where you will find the mandrake root. When the maze is fully mapped you should have found the location of the way out and probably an important object hidden at the centre.

Lighting the situation

Darkness is an obstacle to be overcome in many games. Woe betide the unwary explorer who ventures too far without a light source for he/she is bound to fall foul of an unseen pit or monster. Normally the solution is a simple matter of finding a lamp and turning it on.

Sometimes lamps need a flint or match to light them, but remember that lamps don't always last forever. If a lamp runs out you could try refilling it with oil, and torches may require new batteries. But in many cases, when it's over, it's over, so make sure the lamp is only on when you need it and switch it off when you don't.

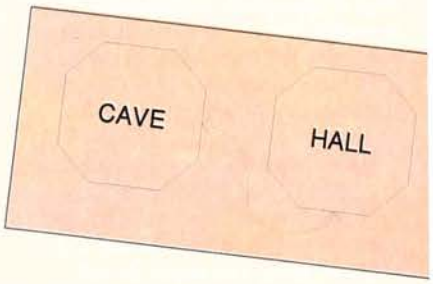
Of course, some games come up with more original methods of providing illumination. In *The Pawn*, for example, you will find a red, green and a blue. When you realise that the best light is white you shouldn't be far from working out how to keep yourself from being in the dark.

Doors and locks

Sometimes, as an adventurer, you will find your progress blocked by the simplest of objects, such as, for instance, a door. Of course, all the important ones are always locked. The most obvious answer is to find the key, but in a single adventure there may be many keys and many doors. There are two common ways of identifying which key belongs to which door.

The key and the door or the key and the keyhole may be the same colour – the red key opens the red door, or they may be made of the same material, so the bronze key opens the bronze door. Both these methods are used to great effect in the old BBC adventure, *Twin Kingdom Valley*, in which there are many sets of keys and doors that match each other in hue and material. In this game, keys made of precious materials are also treasures, so watch out for this in treasure-hunting adventures.

One to look out for is the *key in the other side of the door* puzzle. Sherlock Holmes used this trick and the Famous Five after him. Every self-respecting adventurer should know this one. The solution involves sliding something flat under the door, usually a piece of



paper, and then pushing the key out of the lock with a long, thin object like a pencil or a piece of wire. When you pull the piece of paper from under the door the key should be on it and you can unlock the door from your side.

This is used in *The Ring of Time, Simon the Sorcerer* and also in *Wonderland* where there is a good example of a clue in the location description. The location description mentions a large gap between the bottom of the door and the carpet. Some doors are locked from the other side and you can only open them from the other side. In the *Wheel Of Fortune* there is a locked trapdoor in one of the first locations, but you can only open it from the other side near the end of the game.

There are a number of other ways to open doors. Buttons and levers are often used, especially in graphic adventures where they can be drawn on the screen. Buttons are often used on lift doors and are sometimes labelled if you examine them, indicating their purpose.

In the adventure game *Fish*, doors are opened by putting your hand on a handprint. In some games, such as *Darklands* – a PD adventure – you need to know the magic word to open an especially important door, and in others, politeness pays off. In *The Pawn*, if you keep knocking on the perspex doors, the porter will eventually let you into Hell.

A bag of many things

Most adventures will limit the amount you can carry, and often they will limit the number of objects you can have at any one time. A few will assign each object a weight and allow you a maximum which you are able to carry.

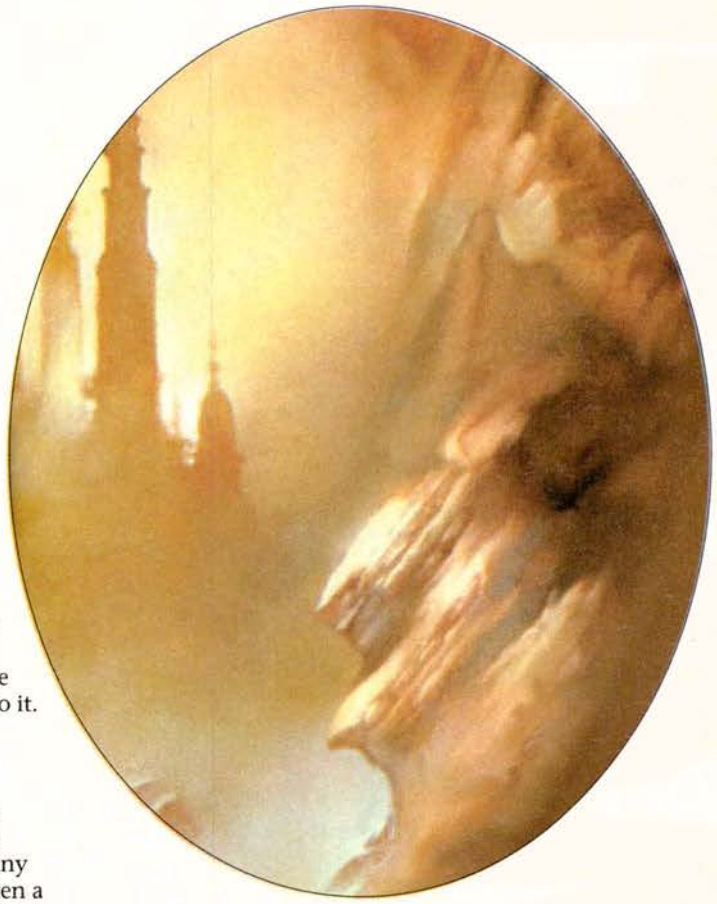
This problem can be alleviated by finding some sort of container to carry objects, such as a backpack or casket. Sometimes only certain objects can be put in a container. Some objects are too large, and in *Twin Kingdom Valley* if you put the lamp in the holdall while lit, it will set fire to it.

Scoring points

In treasure-hunting adventures, where the aim of the game is to score points by collecting as many treasures as possible, there is often a location where treasures can be safely stored. Sometimes it is necessary to store treasures here in order to gain points for them, as if you drop them just anywhere, they are likely to be lost or stolen. Be careful when dropping delicate items as they may break.

The Ming vase in *Colossal Cave Adventure* shatters if you do not drop the pillow first to cushion its fall. In fact, always be careful when and where you drop any object because you may need it again.

If you have to drop something to enable you to carry more, try to leave it somewhere relatively safe so that you can find it again. However, some items need to be broken as they contain a much needed item – such as the toy robot in *Haunted House*.



Location Number	Object Dropped in Location
1	MOULDY CHEESE SANDWICH
2	PINK GLOVES
3	MANDRAKE ROOT
4	HOE

	N	S	E	W	NE	NW	SE	SW	U	D
1										
2			4							
3										
4	3									

● *Table 1 and 2: The best method of mapping a maze in an adventure is to make a table. In this example, the player has dropped objects so they can recognise a new location*

Talk or fight?

In the majority of adventure games, and particularly graphic adventures, you will meet other characters. The key to dealing with these rarely lies in hostility. Violence either results in the death of a vital character or your own. Even the gentle Guru in *The Pawn* will kill you using his martial arts skills if you attempt to hit him.

Violence should only be used if the character is obviously hostile. The Werewolf in *The Wheel of Fortune*, an old Epic BBC adventure, will kill you if you don't kill him first. Usually, if a character has to be killed to complete the game, you will require a magical weapon to do the deed. The Werewolf must be shot with a silver bullet and to kill Kronos in *The Pawn* you must throw a magical vial at him. But in general, communication or cunning succeeds over outright violence.

Now, Journeyman Adventurer, you should be well equipped to tackle any adventure. But remember, there are many, many other types of problem which are not described here. At least now you will not be held up by problems which hardly give seasoned adventurers pause for thought and you can get on with all those many original puzzles the devious adventure games writers have come up with to frustrate you. In adventures anything can happen . . . have fun.

NEXT MONTH

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Interfacing with the world

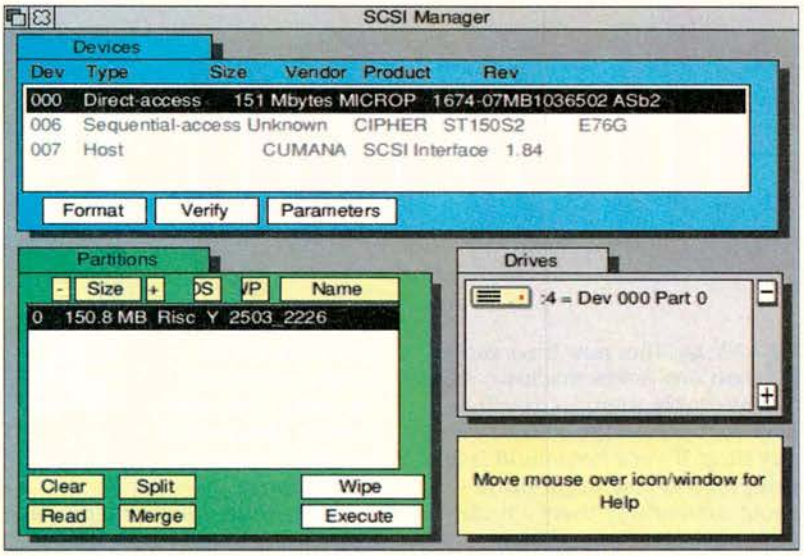
Clem Vogler peers into the mysterious world of SCSI

WITH the release of Cumana's SCSI II interface card, the wait for 32-bit SCSI access is over. I switched my elderly Microp hard drive to SCSI II connection and was rewarded with an immediate 60 per cent increase in file transfer speed from ADFS to SCSI. Most of the transfer time is occupied by head seeking and writing, so with a faster, modern drive, the improvement would be even greater.

There are other benefits too. There is on board buffering – only 16 bytes, but that enables it to meet the ANSI X3T9.2 SCSI standard. SCSI II has 1Mb of on-board flash Eprom which holds the SCSI and CD filers and drivers, so these are loaded automatically at power on and don't need installing or booting. Flash Eprom can be updated from floppy upgrades and contributes to future proofing.

There are software selectable active terminators, so you get more stable performance at high data rates and don't need to fiddle with dip switches. There is an elaborate security system with two password levels and a further five level CMOS lock to control access to all or part of the CMOS settings. An attractive SCSI Manager utility gives wimp control of devices, drives and partitions, deals with formatting and mapping, and banishes the need for command line programming.

A SCSI peripherals diagnostic utility called SCSIDiag comes as standard. I ran it and it returned a reassuring *device meets or exceeds specification message*. As I had no faulty device to tease it with, I took a peek inside its messages text file which holds a catalogue of horrors such as *medium format corrupted, hardware error, unrecovered read error, illegal block address*, as well as the less alarming, *write protected* and *medium not present*. Cumana assure me that the main use is for checking that data transfer rates are up to scratch.



● *SCSI manager*

Connection

Two connectors are provided – a 50-way ribbon cable connector for internal devices and a 50-way Centronics socket on the backplate for external devices. SCSI II supports a full range of SCSI peripherals including fixed and removable hard disk drives, read/write magneto-optical and CD-Rom drives. Sequential devices like streamer tape drives and scanners are supported, but will need dedicated driver software. This may come with the device or may be available separately. For example, David Pilling provides scanner drivers and Digital Services streamer tape drivers.

RISC OS only supports hard drives up to 512k, but 1Gb and 2Gb drives are now available. The Cumana solution is to provide software to divide a large drive into a maximum of four partitions which can be separately iconised and accessed by RISC OS.

PRODUCT SPOTLIGHT

Product: SCSI II interface
Price: £199
Supplier: Cumana, Pine Trading Estate, Broad Street, Guildford, Surrey GU3 3BH.
Tel: 01483 503121
Requirements: A300, 400, 500, 5000 or Risc PC with ARM2 or ARM3

Direct memory access

Direct memory access (DMA) transfers are ones which access system ram without bothering the CPU – available on the Risc PC but in the bottom two expansion slots only. Cumana quote 32-bit direct memory transfer rates of 5.8Mb/s.

SCSI I cards have typically managed about 1.25Mb/s, so the improvement in data transfer rate is around four or five times, though with reading and writing times constrained by the hard drive, the overall access time with a decent drive should be about halved.

A further advantage of using the DMA connection is that the CPU can get on with other things, so a lengthy file transfer can be running in the background without slowing down intensive CPU activity up front.

Summing up

Fast machines like the Risc PC need efficient peripheral connections and SCSI II provides this. You can still buy SCSI I 8/16 bit cards at a little over half the price, but that's like making Linford Christie wear wellies.

A time for sharing

Bruce Goatly recounts experiences with setting up a domestic network

● *Sharing the A5000's hard drives...*

MANY families now have more than one Acorn machine, and inevitably there are conflicts over who gets to use which one at any time. If your household is in this position you might think about networking them – it can cost much less than another machine and can avoid many arguments.

I recently bought a Risc PC for use in my small home-based business, and before long I was looking for a way to move files between it and the A5000 without all that tedious messing about with floppy disks.

I opted for the Acorn Access system using Atomwide's ethernet interface, which allows peer-to-peer disk and printer sharing. This means that every machine can access every other machine on an equal basis. The other type of network has one machine dedicated to serving the others' needs, such as running the printer or acting as a central store for applications and files.

With Access you can even have applications or files from one machine on the pinboard of the other, ready to be launched with a double-click. With certain reservations you really don't need to worry about which machine's resources you are using.

What arrived were two cards, two T-pieces, two blank termination plugs and a length of cable. Fitting the cards was pretty easy – the one for the A5000 was a normal podule.

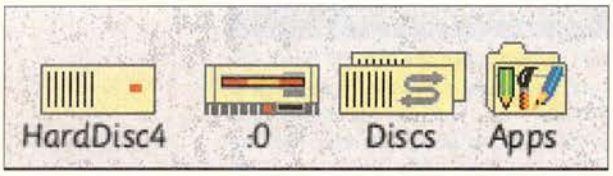
However, the Risc PC's is smaller, and doesn't fit into the backplane. Instead it goes in a small three-row socket at the back of the motherboard.

The hardest part of the installation turned out to be removing the small metal panel covering the slot for the Risc PC – although flexible it had tabs that wouldn't let go easily. Cautious brute force eventually proved equal to the task, and I then found I was just able to fit the card without dismantling the slices. This was probably inadvisable, but it saved some time and hassle.

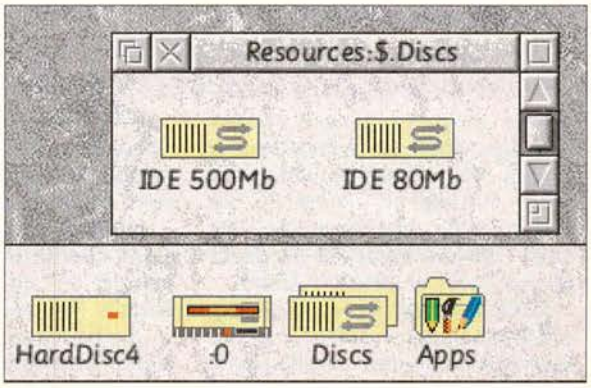
The cable runs between the T-pieces, which plug into a socket at the back of each board. The blank terminator plugs go in each of the other branches of the T-piece. And that's all there is to it.

Up and running

Turning on the machines gives you a new icon on each icon bar – a hard drive icon enclosing a double-headed arrow, with *Disks* underneath. However, clicking on the drive opens an empty window,



● *The new* Disks *icon means that the card is plugged in*



● *...makes them accessible to the Risc PC*

● *Both A5000 hard drives on the Risc PC's icon bar*

because as yet you haven't told the other machine to share any of its disks.

For this purpose the hard drive menus now have an extra item, *Share*. To share a hard drive on one machine with the other, you just click *Menu* on the drive icon and choose *Share unprotected*. If you now click on the other machine's *Disks* icon you find that drive's icon has magically appeared.

Double-clicking on this in the usual way adds the drive to the icon bar, ready for use – it really couldn't be easier. Other devices can be added to the system – for instance, SCSI hard drives or CD-Rom drives – by the Share command:

```
*Share SCSI::SCSIDisc4.$
```

This adds the root directory to the icon bar of the other machine. It doesn't have to be the root directory. In fact, if you need to restrict access to files and directories lower down the structure, you could specify a sub-directory.

If you decide to share a removable medium such as a CD-Rom, it will need to be unshared before removal. You can simply set up small Obey files to do this.

You can access files compressed with Computer Concepts' Compression on the other machine – my thanks to Simon Middleton for this advice – by, for instance:

```
*share CFS#ADFS::4.$
```

This effectively adds a new compressed drive to the network and forces files to be decompressed before transfer, so you don't need to have !CFS on both machines. Either of these Share commands can be placed in the !Boot file on the relevant machine.

Share and share alike?

What are the limitations on what will run across such a network? So far, I've found that they fall into two distinct categories.

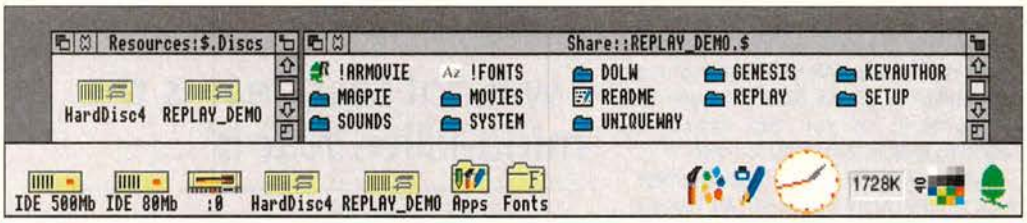
The first is where an application needs to have hardware attached to the machine running it – for example, comms software needs the modem to be plugged in, and a direct printer driver obviously needs the printer. However, !Printers 1.22 has a Share option which allows you to share any printers connected to the network.

The second is where protected software examines which machine it's running on. Impression Publisher, for example, needs a dongle and runs other checks as well. DataPower also installs special protection.

Many of these restrictions can be removed by getting special network versions from the relevant software houses. However, for printing, I get by with printing to file down the cable to the A5000 and then print from the file to my Calligraph, which for reasons I won't go into here is connected to the A5000.

The only other disadvantage is that the networking software grabs a fairly hefty chunk of memory from the host machine's ram, so 4Mb is really a minimum requirement. At some time I may need to upgrade the A5000 from 4Mb to 8Mb, especially if I want to run !NewLook.

For a simple set-up like this you can expect to pay about £250, though long cable runs will add to the cost. Overall, I'm really pleased with the benefits I've gained. And of course, backing up files from one machine to another has never been easier.



● *Sharing the Risc PC's CD-Rom drive with the A5000*

Views from the software houses

Software sold to individuals is generally licensed which restricts it to being run on one machine only, by one person. Educational establishments can buy a site licence allowing it to be networked. Depending on the policies of the software providers, the extra cost may be fairly small or it may be several times the single-site price.

Running single-user applications on a domestic network would obviously be contrary to the licence conditions, but for family use it might be thought unreasonable to have to pay the extra. I conducted a straw poll of software houses to see how they would view this situation, and whether a *home licence* had been considered.

There was something of a divergence of opinions. In one camp there are those who know that some unlicensed multiple-machine use will go on in the home and take the view that as long as the software has been paid for, it would be too costly to police these technical infringements.

Computer Concepts sell second dongles at a cut rate for their self-enforcing products. Clares regard their domestic customers as educated enough to understand the implications, though they include FAST leaflets with software sent to educational establishments.

Icon Technology are interested in *the user* – the home office situation is, in their view, only slightly extended by networking. 4mation offer free site licences on most of the software that would be likely to be affected.

Beebug, on the other hand, officially hold the line that software is for single-machine use. Schools definitely need a site licence, and others using a network should contact them.

It is unlikely that Beebug are alone in having this viewpoint, so you can't just assume that software bought for a single machine can be operated legally over a domestic network.

The moral is twofold – first, read the licence conditions, and second, if in any doubt, *check* with the software company.

Dune II – The Battle for Arrakis

I will not fear, fear is the mind-killer, fear is ...

DUNE II comes on eight disks so is best installed on a hard drive. Apart from the usual Info and Quit, the iconbar menu allows you to set the screen mode *type* – either CGA, VGA or Enhanced VGA. Choose the one most suited to your monitor and click the iconbar icon to start.

At the main title page you are given the option of starting a new game, loading an old one or exiting. If you've read any of Frank Herbert's Dune books, you can assume that this game takes place a considerable time before the written events.

You're in the service of either House Atreides (the good guys), Harkennon (the bad guys), or Ordos (the sneaky bad guys) – all of whom are operating on the surface of Arrakis. Theoretically you're just there to mine *spice* from the sand, but in fact it's almost open warfare.

First of all you have to choose which of the Houses you're going to work for. They each have different features and the ability to create different types of equipment, so you can expect a different style of gameplay for each.

From there you go to a section where one of the Bene Gesserit (all female religious order/political power) describes what the home world of your chosen House is like. Next comes the House Mentat (human computer), who explains the scenario and gives you your first task – to mine a certain quantity of spice.

The screen gives you an overhead view of a portion of the playing area you're operating in. There are two drop-down menus/screens giving you access to the Mentat, who has one hint for playing the mission and information about all game objects. The other menu controls Game Options, Loading and Saving, and Quit.

The gameplay involves building up a base by spending *spice* credits, creating the foundations, and then constructing the building to put on it. Each building then provides a service, but takes power and may use *spice* credits to construct further game objects. You start with a credit allocation and a construction yard, plus some vehicles and infantry which are enough to get started.

Initially you need power, so the first item to create is a Wind Trap. From there you can build a spice refinery which comes complete with a harvester. The harvester will go off and find spice deposits in the sand to collect, and when it's full it returns to the refinery and your credits begin to mount.

Other buildings include a Radar station which gives you a long-range view of all the areas that your side has covered in a panel on the right. The Light Vehicle Factory can build armoured Trikes and Quads, the Barracks can create infantry, and there are Silos for storing excess spice which would otherwise be lost.

The buildings themselves degenerate and may have to be repaired, using up valuable credits. There are also limits to the number of vehicles and infantry that can be controlled – once the limit is reached no more can be built. Not all the buildings are available immediately, and different Houses get different options on what they can build.

All vehicles and infantry are controlled from the side panel. You click on one and get a confirmation message, then a series of options appear such as Move, Attack and Retreat. You can select one with a click or pressing the appropriate key which is much faster. In the case of Attack and Move you also have to click on the target or destination.

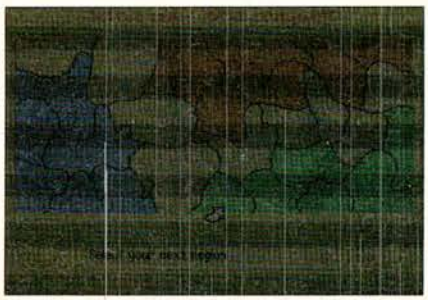
The first mission is just a matter of accumulating spice, with the occasional attack from an enemy House. Basically it lets you get the feel of playing the game. From there you get the game protection kicking in, and you have to enter information from the manual. A word of caution here – you must enter *exactly* what the manual says. Later missions are much more combat oriented, but you still have to mine spice to gather resources.

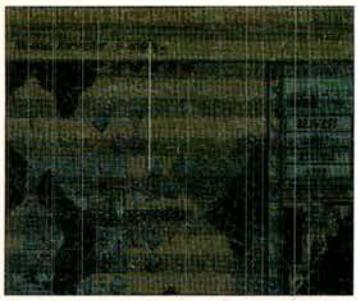
In some ways I'd say you have to read at least the first Dune book to get a real flavour for the game and a picture of what's going on. The graphics seem rather low quality, but it still makes an impressive strategy game with a definite *one more go* feel.

Lazarus

PRODUCT SPOTLIGHT

Price: £34.99
Supplier: Eclipse, Unit 1, Shopwhyke Centre, Chichester, West Sussex PO20 6GD.
Tel: 01243 531194
Requirements: 2Mb ram





Driving Test

Keep your eyes on the road and one hand on the wheel

● *Okay – ready for the final test?*

TEN out of Ten are best known for their educational games, but this program comes with a *leisure interest* tag. It is a unique way to test your knowledge of the road and your vehicle without venturing outside.

Basically the program splits into six games: Word Park, Clunk Click, Patience, Rear Mirror, Signpost and Speed Trap. Your progress is kept on a board which you need to fill with green or blue to be sure of passing the *driving test*, which is open to you when you have completed enough of the levels.

You can choose to have questions spread over six levels of difficulty and covering a broad range of categories. For instance, continental driving and trivia are two subjects you might want to leave until you are happy with all the other areas and have passed your test.

One word of advice is to read the questions very carefully – it is only your bonus clicking away at the top of the screen, not a time limit.

Word Park asks you a variety of questions. Answer correctly and you can reveal letters comprising the hidden word. This can be connected with cars and bikes, car parts, motor sport or motoring terms.

Clunk Click rewards correct responses with a game of pelmanism. This can involve pairs of UK, continental, warning and order signs, and so on. This game is a useful piece of reinforcement.

Signpost allows you to customise the game which comes as an addition to the questions. These vary from the common sense needed for safe driving and the requirements of the driving test itself, to trivia for a little light relief. Here you must reveal a sign with your correct replies and correctly identify it – no easy multiple choice here.

Patience takes a different angle, with you paying the forfeit of a question each time you want to turn over a card.

Rear Mirror in particular is fun, as your aim is to correctly identify a sequence of numbers in the rear view mirror. If this is a little too tricky you can opt to see the numbers straight or dispense with the game element altogether. If you just want the questions and no game element, play Rear Mirror with the mirror set to *broken*.

Speed Trap is the last game and here speed of response is important, as each correct answer you give allows you to move a racing car back, giving you more time to answer the questions. You can change the settings on this to make it more or less challenging.

If you've had enough successful lessons – five in which you have scored over 70 per cent on at least Level Four since you started or since your last fail – you can take the test. The test itself constitutes: an eyesight test, signpost and stopping distances, starting the car – in fact all the areas on which you will be tested *on the day*.

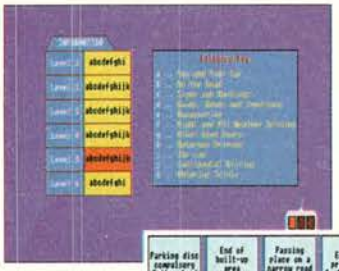
You are not told the correct answers, but at the end you are given a pass or a fail certificate – which you can print out – with the areas noted in which you need more practice. Answer dangerously and the examiner will terminate the test there and then.

Driving Test should not be seen as a replacement for learning the Highway Code, but as a supplement to it. You will learn things from the software, but the random element is a little too narrow for you to rely totally on it. I realise that repetition/drill and practice is a good way of making people learn, but I would prefer it if the program did not repeat the same questions so often, or only did so if you kept opting for the wrong response. It is also an excellent way of proving that most people forget the niceties when they have been on the road for a few years. Recommended.

Jo Giles

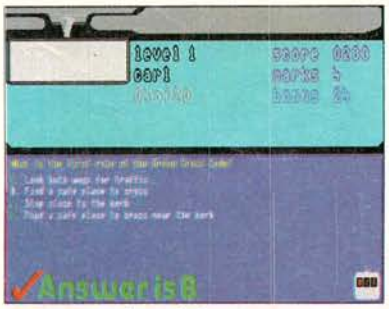
PRODUCT SPOTLIGHT

Price: £25.95
Supplier: Ten out of Ten, 1 Percy Street, Sheffield S3 8AU.
Tel: 01142 780370



● *What do you want to practice?*

● *Questions can be textual or graphic*



● *Test your knowledge without any gameplay*

● *How's your continental knowledge?*

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Cyber Chess

A complete game

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This great game has superb 3D simulation, is Risc OS compliant, has full implementation of all applicable chess laws and is suitable for high spec machines. *Cyber Chess* also offers particular support for beginners and children, and good support for stronger players.

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Net book agreement

Pam Turnbull surveys some of the books aiming to guide you to the best surf

The Internet Complete Reference

BOOKS on the Internet fall into two categories, one small and one large. The former are the titles aimed at the UK market, while the latter are produced for the US market. This is not to say that these should be dismissed, but you may find that much of the information is irrelevant.

Hahn and Scott's book is one definite must for the shelf if you are serious about learning what this *Internet-thing* is all about. Much of the information crosses the Pond quite easily, such as comprehensive sections on Archie and FTP sites. The introduction appealed to me for the following quotes: *The Internet is easy to use, but difficult to learn* and more elitist, *The Internet is not for nerds, but just as surely it is not for dummies.*

The book does not require you to be a computer genius, it does not expect you to know Windows, and more importantly it is well written and doesn't take itself too seriously. So what can you get out of it? It starts with the basics of what the Internet can offer you as an individual. A nice change from all the trite phrases coming from anoraks and politicians alike. There are boxed-out hints throughout each chapter which you could spend a lifetime finding out for yourself.

Particular attention is paid to Internet services such as Telnet, Finger, Usenet – very comprehensively too – Anonymous FTP, Gopher, Wais, World Wide Web and Archie. Some chapters are more suited to those familiar with Unix, but are nevertheless well worth reading. In fact for a reference book with good indexing, it is a surprisingly interesting and well-laid out read. The book ends with a catalogue of resources and Usenet groups.

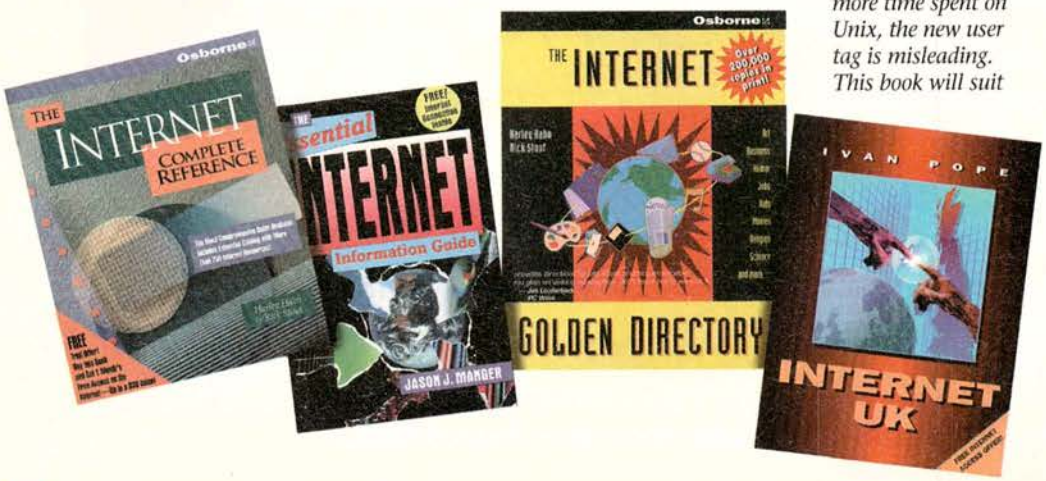
- *All in all this is a sound reference book which is a must for anyone interested in the Net regardless of whether you want to paddle or surf in earnest.*

The Internet Guide for New Users

THIS book is not as appealing as Hahn and Scott's effort, as the layout screams *technical*. Not that this is bad, but it is a book supposedly aimed at new users of the Net, people who are not necessarily going to be computer buffs in the first place.

Persevere and what do you find? The history and technology of Internet is interesting and it soon becomes clear that this book does not aim to have you up and running in five minutes. I would also disagree with Dern that you should know something about Unix to just log on. The major problem for this book in the UK must be that it is written for the American user in the States.

- *While this covers much the same areas as Hahn and Scott but with more time spent on Unix, the new user tag is misleading. This book will suit someone who has a good grasp of the technology involved and will know which sections to discard for a UK and Acorn marketplace. Dern has a more staid writing style with a penchant for Alice in Wonderland quotes.*



The Internet Golden Directory 2nd e

IN some ways this book carries on what was started in the *Complete Reference* with a list of resources and Usenet groups. Basically it's a *Yellow Pages* for the Internet, but the nature of the beast means that it was out-of-date as soon as it was compiled.

This does not aim to be comprehensive – an impossible feat. However, what it does offer you is a list of the areas of interest and the more *stable/established* areas. Let's take **television** as a subject area at random. Well, you'll find a list of topics from Beavis and Butt-head to the UK sitcom list. I plumped for Northern Exposure and found myself faced with the Anonymous FTP sites addresses and paths, Internet mailing lists and Usenet newsgroup. The same is true of hundreds of other subjects from the sublime to the ridiculous.

- *I have a confession to make: this is not a book I would have automatically sought out and bought. However, as a springboard into the right areas and the inner workings, it is invaluable. Recommended for a group of novices as it will save some precious phone time during the early weeks.*

Planet Internet

IF you now feel the time is right for a little irreverence, Planet Internet is for you. The basic philosophy of this offering is to forget the brave new world approach – let's sample the night life. It is a personal guide to the weird and wonderful things you can find in the nooks and crannies, and is an amusing and entertaining read. Yet this is more than a little black book, as Rimmer has some serious points to make and advice to give.

Usenet, FTP sites, e-mail, netiquette, Telnet, Gopher and so on are all covered, but as a reminder of the terms you are about to see rather than in any great depth. The appendices do go into a little more detail, but this is not a book to give you the definitive user guide to the Internet.

The sites (sic) are laid out for the visitor in alphabetical order. So using the random approach, I opened the listings at *Origami*. Listed under each subject are e-mail addresses for sending items to the mailing list, and another for adding your name to the

mailing list. You'll also find FTP sites, Gopher, Finger and Usegroup addresses.

Rimmer gives a brief resume of the subject and group and often an extract to give you an idea of what goes on. For instance, the FTP site for origami is *rugcis.rug.nl:/origami/*. This holds articles about the subject, scanned photographs of creations and PostScript files so your laser printer can generate folding diagrams for different projects.

- *An interesting and unusual book, this is not a serious guide to the workings and inner id of the Net, but would make a brilliant present for someone who spends long hours in front of a monitor being grateful that the phone bill isn't theirs.*

The Essential Internet Information Guide

MANGER's addition is similar to Dern in style, while offering more depth of information on accessing Usenet without a newsreader, sending e-mail without a mailer and transferring files without FTP and so on.

However, this depth and detail means that Unix is central to the book. If you what to know how this ticks then Manger's Information Guide has a lot to offer. The subject matter divides into three: e-mail, Telnet and FTP. Add to these image processing and file compression, and the world of Inter Relay Chat or IRC.

For instance, the Usenet coverage concentrates on the Unix newsreaders – *nn* and *rn* – and the internal structure of Usenet messages as well as how to deal with binary files such as images and compressed files.

Telnet is also stressed heavily as the key to other services such as Archie, but this is a book for the Unix-enthusiast. Data compression and transfer between platforms via the Net is covered towards the end of the book, as are problems and solutions.

- *A technical, detailed and informative book which doesn't fight shy of hints and tips and is well constructed. Aimed at the more seasoned computer person.*

Internet UK

JUST when you were adjusting yourself to reading American English and learning about the US experience in every book written on the Internet, along comes Pope. This is a slimmer volume than the others, which may be a symptom of general access to the Internet in the UK as opposed to the States. With a free Internet access offer flashed on the cover – if you have a PC or Mac – I turned the page.

The UK content is immediate with mentions of Demon, CIX and Janet. However, it is a thoughtful book which ponders on the problems as well as the hype. I was particularly interested in the different approaches of government to the Internet. In the US, Congress, the Supreme Court, the Patent Office, and Social Security among others have their full information on-line. In the UK you can chat to David Shaw MP but you can't even access UK government press releases. But things are changing, and Pope sees the UK being about two years behind the States.

Okay, so you won't read about Acorn software – rather PC, Mac and Amiga – but I can live with this, especially with 13 pages devoted to the different UK Internet providers, contacts, facilities, rates and so on. Excellent.

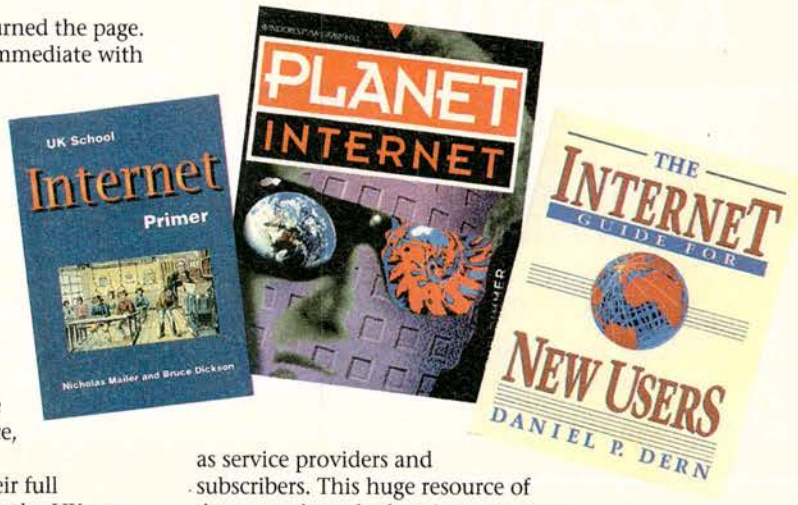
Tools, resources, services and sources complete the rest of the book, supplementing what you have read in the US books. As you'd expect there is coverage of FTP, Telnet, Gopher, WAIS, WWW, IRC and Usenet. But you'll also find information on Hytelnet, Veronica and the commercial Internet.

The sources section is a very handy reference with a Mailbase user reference card, a catalogue of network training materials, booklists, UK commercial domains, international providers and what you should and shouldn't do with Janet.

- *Internet UK is written as a sub-set to any of the books mentioned above to redress the balance towards the UK user. It is not attempting to give you the definitive guide and is ideally used with one of the larger US complete works. In this it works very well giving what is probably the most basic, readable and accurate definition of what the Internet is that I have read so far.*

UK School Internet Primer

IF you are a teacher interested in the Net, take a look at this one. In 155 pages, Mailer and Dickson aim to give you a basic grounding on how to make the most of this worldwide resource. Navigating the Internet is an education in itself, but academic establishments outnumber all others as service providers and subscribers. This huge resource of data, people and talent is as open to a child in a primary school as it is to someone in higher education.



By putting the colourful newspaper headlines into perspective when it comes to network nasties such as pornography, the book manages to reassure as well as offer practical solutions to this very small problem area.

The Primer is what it purports to be. This is not an in-depth look at the Unix aspects, but rather a highly practical and informative book for anyone who wants to access the Net for their own and their school's needs. Clear definitions and a lack of unexplained jargon make it ideal for someone new to computers and the Internet. Furthermore, this is the only book I have found so far which acknowledges the existence of Acorn.

- *Well written and easy to read, it covers the points a teacher wants to know. The information enables anyone to use the Net and access the information to be found there as quickly, simply and cost effectively as possible.*

PRODUCT SPOTLIGHT

The Internet Complete Reference: Hahn & Scott Osborne, £23.95
ISBN 0-07-881980-6

The Internet Guide for New Users: Dern McGraw-Hill, £24.95
ISBN 0-07-016511-4

The Internet Golden Directory 2nd e: Hahn & Scott Osborne, £22.95
ISBN: 0-07-882107-X

Planet Internet: Rimmer Windcrest/McGraw Hill £21.95
ISBN: 0-07-053015-7

The Essential Internet Information Guide: Manger McGraw-Hill, £22.95
ISBN: 0-07-707905-1

Internet UK: Pope Prentice Hall, £19.95
ISBN: 0-13-190950-9

UK School Internet Primer: Mailer and Dickson Koeksuster Publications, £8.50
ISBN: 0-9524072-0-5

- *All books are available from good bookshops or via mail order from Computer Manuals (0121-706 6000)*

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VISA Access

The greatest resource

Teri Paul looks at one of the major strengths of the public domain

IF you'd asked people years ago what they wanted from a computer, most would have had word processing at the top – or fairly near the head – of their list.

Now people may elaborate with *DTP* or even *multimedia*, but doing things with text is their first priority. The way !Printers works and the facilities made available by outline fonts means that the RISC OS machines are the easiest to get into. Yet for my money it is the ability to access PC and Mac disks almost effortlessly which makes the Acorn top.

For PD DTP access for anyone with a CD-Rom drive I would definitely recommend APDL's DTP1. As well as including images from the UK they also have a selection of US clip art which has been changed into sprite files for you. The CD itself is designed for anyone who wants a collection of clip art and illustrations for RISC OS machines – the majority of files are in sprite or draw format. Don't despair if you haven't got access to an Acorn CD-Rom as APDL's disk can be accessed on a PC CD-Rom drive. You can then put images on a PC disk and transfer it to your Acorn machine.

Initially the disk opens to reveal three main folders: *Colour, DTP* and *Earthmap*. *Colour* opens for access to images on: Animals, Art, Cartoons, People, Plants, Space, Transport and Weather. Picking a category at random I went primarily for Space. This section is further divided into: Earth, Fiction, Future, Present, Solar Systems and the Universe.

Following the *roll a dice* principle I opted for Fiction, and discovered some rather nice images of the Babylon 5 station as well as images from Deep Space 9, Star Trek – original and Next Generation – and Star Wars.

Up to now I have been rather disappointed with the quality of such images, most of which are straight grabs from TV or video, and usually America's awful NTSC standard. These are a mixture of publicity stills, design shots, enhanced grabs and illustrations, and with a few exceptions they are much better than average, with a number of the grabs being enhanced for a better resolution.

Entering the *DTP* section I was reminded of the original definition of clip-art. These were sheets of line drawings which designers and artists used to *clip out* for use. This is basically what you have here, scans of individual line images in sprite or draw format and sometimes whole clip sheets. As these are scanned, the quality is not of the highest, but there is an awful lot here to choose from, and if you can't draw these are a vital resource.

For original artwork you should lean more towards the shareware which here includes samples of some of the better collections – though all US-based. Artists such as Ben Brown – based in Michigan, USA – give you a selection of animals and people to choose from. There are also images with a biblical theme from Pastoral Computer Service in Greenville, California or a variety of clip art images from Daniel Austin in New York. I particularly liked the quality of the Grin Graphics selection, but as they are based in Jacksonville, Texas, it might be a little off-putting to order in US dollars. You could however use your credit card, and remember to ask for PC disks which you can then convert on your Arc via ChangeFSI or Translator.

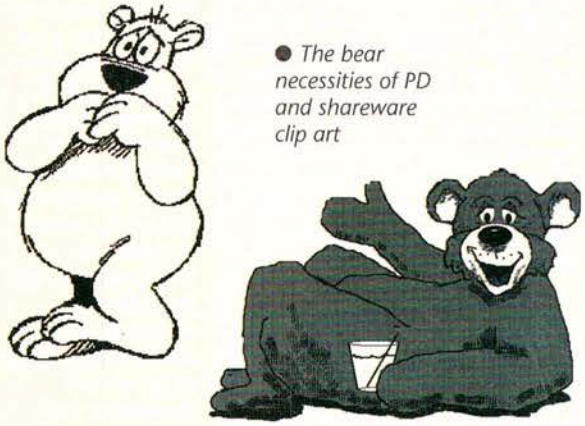
The final section is *Earthmap* from John Kortink, which is a potentially useful application, being an electronic globe. APDL have added their own tutorial on top of the official one which helps matters, but this is still only an aid to finding required places and does not claim to be a totally accurate map and grid. Personally I would need more information, and the ability to add notes and detail in the basic program rather than save a drawfile and add these details in another application.

Perhaps a bit out of place on this CD-Rom, so look on it as a bonus rather than as an integral part.

Textual choices ...

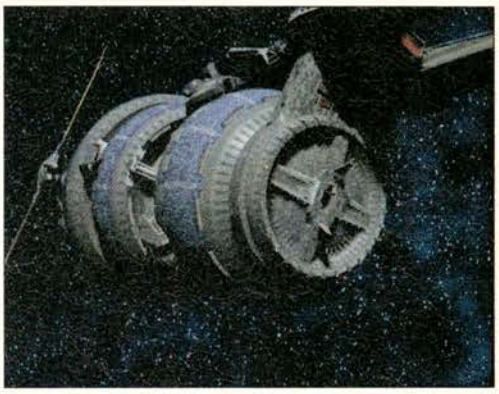
Disk-based magazines come and go with different reasons for their existence. Spectrum purports to specialise in the public domain. Russ McKendrick of Sounds Riscy recently sent me their second issue which is available from most PD libraries or you can download it from the Acorn bulletin boards and Hensa. They plan a PD version of the display version in the near future, so you can make your own disk-based mag.

As well as providing articles and reviews with a computer theme, they do access other areas and ➤



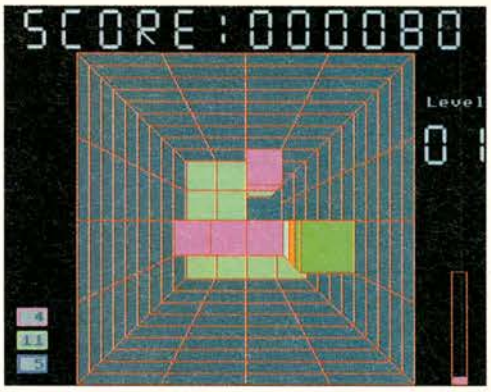
● *The bear necessities of PD and shareware clip art*

● *Access your favourite cartoon characters*



● *For JMS fans – the fifth Babylon station*

● *Enhanced images for your collection*



● *Stacking up your tiles*

advice for Acorn users. Spectrum 2 also contains a selection of PD programs:

Cue to Track uses the new play routines by Phoenix, offering control over your Pro/Soundtracker collection. The options at your mouse pointer include control music, monitoring VU levels, notes and sample waveforms, as well as receiving information on a sample and setting up your own preference and toggle effects.

Most of these options are straightforward, but Cue to Track prides itself on its customisation options. These include Sample Quality which determines the timing of information passed to the sound system – the lower the value the higher the quality, and the toll on your processor. The Iconbar Select action determines what happens when you click Select with the mouse pointer over the iconbar icon, as you can choose which windows will open. Stereo positioning for all four channels can be set up here too, with a number of preset values available by clicking on the relevant icon.

The ability to turn certain effects – caused by the tune – on or off is a welcome addition, with a shaded icon representing an effect that is turned off. An effect can be toggled by clicking Select on its icon. Another choice is the World of Music and Tracking.

The Acorn's IconSprite command loads sprite files into the wimp's sprite area. **ISprites** lets you do that by dragging your sprite on to the iconbar icon, therefore avoiding the need to use the IconSprite command.

Last but not least is **Atchoo**. This is an ARM status changer. Simply click on the iconbar icon to toggle your machine's speed between fast and slow. On ARM2 machines it updates the memory controller access speeds, while ARM3 computers can toggle the 4k cache.

Royalty-free not PD

If you thought you were successfully figuring out the variety of headings for *free* software, watch out for *royalty-free*. This is not freeware or shareware, but usually applies to a commercial collection of images and/or music, for instance, *Image Warehouse* and *Grooves*, CD-Roms from MDI or the PC MPC collections which you can now access fully on RISC OS machines courtesy of CD-Circle.

The restrictions on usage will be in the documentation, but as a rule of thumb you can use the images or music as long as you are not making any money from doing so and the artists are credited. If in doubt, check with the distributors.

... or just something amusing

If you like puzzles and Tetris clones then **Staka** from Ian Palmer is a must. This three dimensional Tetris means that you look down on a cage which you must then fill with lines of shapes in the usual way. There are five different shapes which can be rotated or dropped as required. Totally mouse controlled, this is not easy and works best for those with a good eye for three dimensional puzzles.

While I personally opt for the most playable wire-frame version, you can opt for solid shapes which obscure what is below, though colour coding does help. There is a practice mode to get you acclimatised and then you're on your own.

Once in the game proper you'll be shown the number of blocks that are in each layer, a speed bar, a level indicator and the score. The latter two can be very depressing. The instructions give some hints and tips and if all else fails you can just listen to the music.

An excellent addition to the Tetris family should Tetris and Colour Tetris begin to pall.

PD LIBRARIES

8-BIT HOUSES

8-bit Software, 17 Lambert Park Road, Hedon, Hull, East Yorkshire HU12 8HF.
BBC PD, 18 Carlton Close, Blackrod, Bolton BL6 5DL.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
JJF PD, 49 Hollyberry Close, Winyates Green, Redditch, Worcester B98 0QT.
Masterdisc, 2 Seaview, Hoylake L47 2DD.

32-BIT HOUSES

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Alpine PD, PO Box 25, Portadown, Craigavon BT63 5UT.
APDL, 39 Knighton Park Road, Sydenham, London SE26 5RN.
Arcaynia, PO Box 1927, Sutton Coldfield B74 3QZ.
ArchAngel PD, PO Box 41, Exeter, Devon EX4 3EN.
Archimedes Fractal Group (AFG), 30 Bowen Drive, West Dulwich, London SE21 8PN.
ARMistic PDSL, 136 Wellesley Road, Ilford, Essex IG1 4LJ.
Australian RISC, 241 Hawkesbury Road, Winmalee NSW 2777 Australia.
Cheap PD, Greenways, Grubwood Lane, Cookham Dean, Maidenhead, Berkshire SL6 9UB.
Craig Beech PD, 30 The Deerings, Harpenden, Herts AL5 2PE.
Datafile, 71 Anson Road, Locking, Weston-Super-Mare, Avon BS24 7DQ.
Datastream, 34 Norbreck Close, Great Sankey, Warrington, Cheshire WA5 2SX.
Different Ideas, Eyton House, Eyton, Leominster, Herefordshire HR6 0AG.
Digital Phenomena, 104 Manners Road, Southsea, Portsmouth, Hampshire PO4 0BG.
DigiTech, 20 Downing Crescent, Bottesford, Scunthorpe, South Humberside DN16 3LS.
Eureka PD, 78 Rawlinson Road, Southport, Merseyside PR9 9NE.
Five Star Marketing, 4 Shepherds Walk, Bushley, Herts WD2 1LZ.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
LowCost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.
Lunchtime Disk Magazine, 203 London Road, Chesterton, Newcastle, Staffs ST5 7HF.
Moonlight Graphics, PO Box 3569, Cape Town 8000, South Africa.
Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.
Planet PD, 37 Manor Drive, Berrylands, Surbiton, Surrey KT5 8NF.
Skyfall, PO Box 2220, Birmingham B43 5RZ.
The ARM Club PD Library, 19 Woodberry Way, London N12 0HE
Westbourne Services, 34 Bradley Street, Wooton-under-Edge, Gloucester GL12 7AR.
Xi Software, 1 Avon Drive, Alderbury, Salisbury SP5 3TA

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Product: Rosie and Jim Talking Activities – Duck Loses his Quack, Jim Gets the Sneezes
Price: £10
Supplier: Sherston Software, Angel House, Sherston, Malmesbury, Wiltshire SN16 OLH.
Tel: 01666 840433

THERE is now nothing new about the talking book concept. Several companies produce such products and this inevitably means that the quality continues to rise. Sherston's latest pair of releases are based on Central TV's very popular Rosie and Jim programme for children. More stories are promised in the same series.

Sherston have, as ever, been very thorough with their preparation and you don't need to know the programme to enjoy the software, but some of the words and actions that the two cuddly heroes go in for are better understood by those who know the routines and traditions of Central's show.

The speech is of course well digitised and the actors who play Rosie and Jim were used for the software, along with a very clear narrator. The graphics are clear and simple, following the style of the TV programme, but seeming to make very good use of the computer. At Acorn World I saw the programs running on a Risc PC, and the pictures were crystal clear. On my own rather more humble A3000 with bottom of the range Acorn monitor, the drawings are still extremely good.

However, I am not too impressed with the speed of loading samples and pictures on my A3000. I still use ARM 2, and frankly, I lost interest waiting – mid sentence – for the next speech sample to be loaded, de-compressed and then played. To make the running speed better, I transferred the files on to ram disk. You still need the Startup disk in the drive – Sherston's software protection policy – but you then get a very good speed of running. To do this you will need 2Mb, nothing else loaded and a certain amount of knowhow.

● *The start of all Rosie and Jim stories is a quick kiss on the sofa*

● *At the end of the stories, Jim plays his accordian*

Perhaps Sherston could try to squeeze in an extra program which could do the required transfer easily?

The instant appeal of these stories was apparent the first time I saw one of them, and a quick burst of the signature tune brought people to look. Almost immediately I was relegated to the background as a couple of five year olds took the mouse, read the story and laughed and giggled their way through as it unfolded. When one story finished, they wanted more.

Rosie and Jim is aimed at those youngsters who are just breaking into reading, but they appeal to much older people too. I have successfully disrupted a lesson at a secondary school where all I was trying to do was show Rosie and Jim to a colleague from a primary school. The class of 13 and 14 year olds who were using the room could not keep away. At every computer club I am now inundated with requests for Rosie and Jim.

Summing up

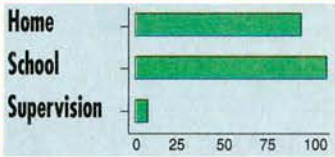
It is the interactive nature of these programs which generates the appeal. In *Duck Loses his Quack*, there is the opportunity to search through a field of animals, where clicking on each of them produces the relevant noise. Young children love clicking the animal they've been asked to find. The older ones on the other hand seem to take perverse enjoyment in getting it wrong. Teachers will like the ease with which screens can be printed out.

Sherston's support is up to its usual high standard, except for the box which is too flimsy. The program guide is concise and simple, though slightly complicated by the need to include instructions for IBM-compatible computers. The curriculum suggestions are first rate and these include ideas for using the packs of matching cards provided with each program.

Any infant school, or parents with preschool children, will get tremendous value from these programs. They represent an excellent use of information technology.

SUITABILITY

ROSIE AND JIM TALKING

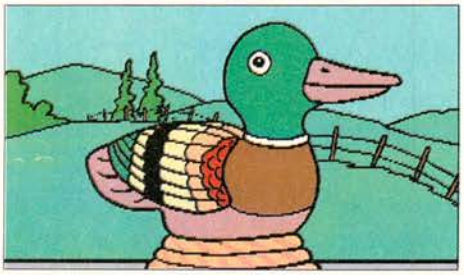


NATIONAL CURRICULUM

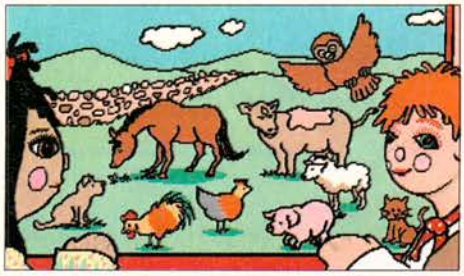
Stage 1 Reading

Ages 3-7

● *One of the stories is Jim Gets the Sneezes. These flowers will cause him a problem*



● *This duck is the funny star of Duck Loses his Quack*



● *An interactive screen. Can you click on the animal that says TWIT TWOO?*

Number work

Are you looking for a package to help four year olds+ with maths? John Clemence examines a contender

LOOKING for something to help your infants with their early number work? Then SUMone may be well worth looking at. In fact, it is a collection of 12 activities for pupils who are beginning to use numbers. Each of the activities can be set to a higher or lower level and you can also have the computer monitor and store the progress of individual children. Space only permits me to describe some of the games, but they are all of similar quality and flexibility.

PRODUCT SPOTLIGHT

Product: SUMone
Price: £29.95
Supplier: Resource, 51 High Street, Kegworth, Derby DE74 2DA.
Tel: 01509 672222

There are six simple counting activities when set to the lower level, while at the higher level the children have to click with the mouse on a variety of possibilities such as *one less* or *two more*.

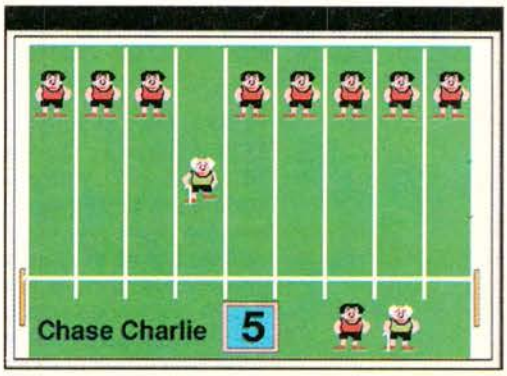
The general rule is that nothing happens when you click on a wrong answer but the number goes blue when you are correct. However, there are some nice exceptions such as the ducks taking flight when you get the answer correct in the activity called *Ducks*.

Flying Mice is an ordering game. At the lower level you have to rearrange the mice so that they are in order from one to 10, and at the higher level you have to work from 10 to one. However, it is not quite clear at which end of the row of cheese pieces the mice have to start or finish. There is nothing in the manual or on the information screens to help, so I had to experiment with this to find out.

A number recognition game is called *Chase Charlie*, although you sometimes have to chase Winston. This is really more of a number position game. It's great fun but you have to be able to think quite quickly about which is column one, two and so on. At the lower level the columns are numbered until you start to win and then the clues are removed. I think this is a good feature. At the higher level you have to do a simple sum in order to discover the correct column.

One of the more open-ended activities is called *The Time of Day*. This presents teachers with an opportunity to talk to children about the kind of things that happen at Sunrise: breakfast time for instance. I only have one small objection to this – the owl is sitting next to a clock which always shows the same time, regardless of the time of day being shown in the picture. At the higher level children have to match the caption to the picture.

● *What time of day is it? But don't look at the clock*



● *Chasing Charlie, if you're quick enough*

Summing up

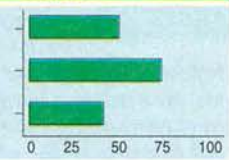
In many respects I am quite impressed with SUMone. The graphics are colourful and, for the most part, very clear. Animation is smooth and plenty fast enough for the children who will use this software and the music can be turned down or even switched off.

The children are not expected to read instructions from the screen but there is plenty of help for the teacher. It is also possible to use the keyboard rather than the mouse, or you can use switches.

SUMone represents good value for money and will certainly find a place in my school's infants department, just as soon as I've finished playing with it!

SUITABILITY

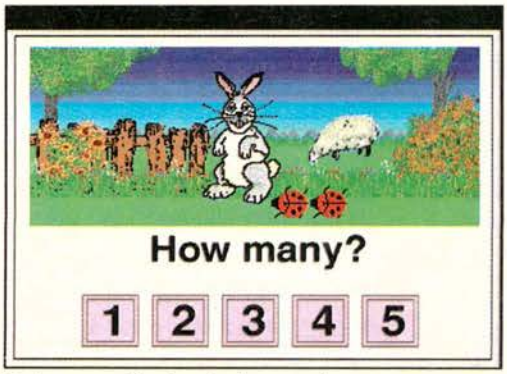
SUMone



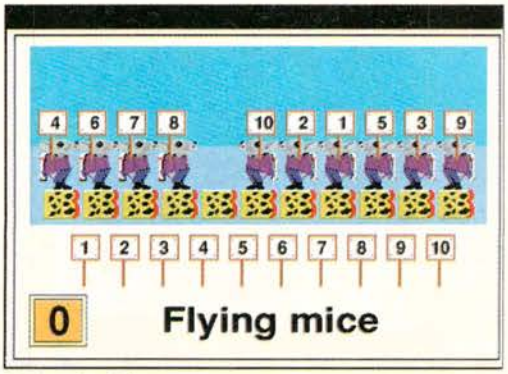
NATIONAL CURRICULUM

Maths Key Stage 1

Ages 4-8



● *Opportunities for simple counting*



● *A cat's nightmare*

Bringing imagination to life. Frank Jukes looks at a new package from Wyddfa

Words and pictures

● *Choose from eight possible answers*

● *Gwen is an accident prone pupil*

● *There is good potential for discussion away from the computer*

GWEN Goes to School is one of four stories in the new Talking Stories series. Aimed at children in Key Stage 1, the series helps in the recognition of four different parts of speech: nouns, pronouns, adjectives and verbs, and in the recognition of colours. This first program in the collection offers practice in the recognition of nouns and pronouns.

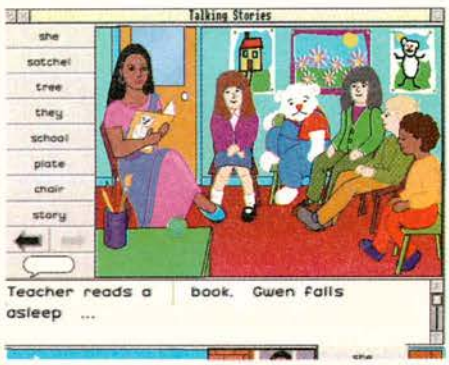
PRODUCT SPOTLIGHT

Product: Talking Stories – Gwen Goes to School
Price: £20 each (inc VAT), £50 set of four (inc VAT)
Supplier: Wyddfa Software, 3 Preswylfa, Llanberis, Gwynedd LL55 4LF.
Tel: 0286 870101

Gwen is an amazingly accident-prone but very friendly looking bear who, as the title suggests, attends school. In eight different scenes, Gwen can be followed through her day, from arrival when she hangs her coat up, to playtime when she almost falls out of a tree, to the end of the afternoon when she finally falls asleep and falls off her chair.

All of the scenes are boldly drawn in bright colours to engage a child's interest, yet with just enough detail to provide plenty of talking points. Each scene is accompanied by a sentence with a word missing, and a list of eight words, some of which might fit, and others which cannot. In the first scene the sentence is *Gwen the bear is at _*, and the choice of words with which to fill the gap is: *chair, school, she, they, plate, tree, satchel and story*. Clicking on any of these words results in it being spoken, and if it is correct, being placed into the gap in the sentence.

● *Sound, graphics and humour are important parts of the learning process*



The sentence, with or without the gap, may be heard by clicking on a bubble icon. This is helpful for those having difficulty or as a reward and confirmation of a correct attempt. The voice is clear and gentle, with a soft Welsh accent reflecting the origins of the package. For those who need a little more help, individual words within the sentence may be heard by clicking on them as required.

To link the images and words seen on the screen with more traditional paper resources, a small book is provided which has an identical copy of the story in terms of pictures and completed sentences. This is potentially very useful, as work undertaken on the computer may be reinforced at a later date with materials which are quickly recognisable and more accessible.

Movement through the story may be controlled to a degree by an option available from the iconbar menu. The default option is to allow access to the next page only when the sentence on the present one has been completed, but it is possible to disable this to allow free access to all of the pages.

A second feature available from the iconbar menu is the level of help available on the screen. At its most helpful, the program will display the missing word within the accompanying picture, while two more settings will offer initial letter help or no help at all. If pupils need to see the whole of the missing word it may well be that the program needs skills beyond those they presently have.

With a program such as this, the pages provided with it are to an extent quite limiting, and children will soon become accustomed to their content. I would very much like to see a version with additional features available to allow the sentences and word lists to be defined by the teacher. This would ensure that it can more accurately meet the individual needs of both teachers and pupils.

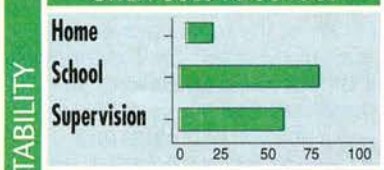
Summing up

The whole package is very simple in concept and has been designed for children to use. However, I believe that it should be used with a good deal of adult supervision if the best is to be got out of it.

It would be too easy, for example, for random clicks to elicit the correct answer, and the experience would in any case be a very narrow one. This kind of work needs an adult to be present to generate conversations about the words and how they work together.

SUITABILITY

GWEN GOES TO SCHOOL



NATIONAL CURRICULUM

English ATs 1 and 2, Technology AT 5

Ages KS1

Reporting the National Curriculum

Rog Frost charts the progress of his pupils

AT first sight, NStore has a rather tedious purpose. It is a program which allows teachers to record their pupils progress against the National Curriculum. However, this is not the time to go to sleep, as this version of NStore does much, much more.

A single NStore disk can hold records for up to 108 pupils spread among three different classes. The disks may not be copied but two are supplied with the pack and extra disks can be bought by registered users for only £3. It will not cost all that much to cope with all pupils in large secondary schools.

The first task for teachers is to enter the name and gender of their pupils. The gender is needed because printed records refer to *he* or *she*. Personally, I get fed up with making out lists, and it seems a shame that this information cannot be imported as a CSV file as the required data is probably already entered on the school's administration system.

It ought to be possible for the IT expert to use these records and so save the hard-pressed teacher another job. However, for most people it is probably quicker to type in the names yet again than to argue about who ought to have done it already.

Once the names are entered – and sorted into order if required – teachers will turn to the National Curriculum screen. This enables any attainment target statement to be seen, for all subjects and at all levels. Pupils can be allocated four different levels for each statement. An empty box indicates that the pupil has had nothing to do with the statement.

A first line indicates that pupils have been introduced to the required concept or knowledge, two lines means they are working towards that level, and a complete triangle indicates success.

Entering these levels is very easy. Just click on the appropriate box once, twice or three times. Topic details can be entered so that all of a class can have records updated in one go.

PRODUCT SPOTLIGHT

Product: NStore
Price: £38.25 (Upgrade to new NC orders circa £4)
Supplier: HS Software, 56 Hendrefoilan Avenue, Sketty, Swansea SA2 7NB.
Tel: 01792 204519

Other areas on the screen deal with general aspects of the pupil's progress. The same triangle system is used to record levels of attitude, effort, attainment, presentation and general skills, and a clever system allows any combination of up to 45 different statements to be stored for each of the above areas. In addition, the program can work out percentage attendance rates from raw data and allows exam results and SAT results to be entered.

Keeping records is only one part of the complex job which all teachers face. Reporting is another task which can call for a great deal of time and this is where NStore scores well. The program can generate text files or print out the data for one or all pupils.

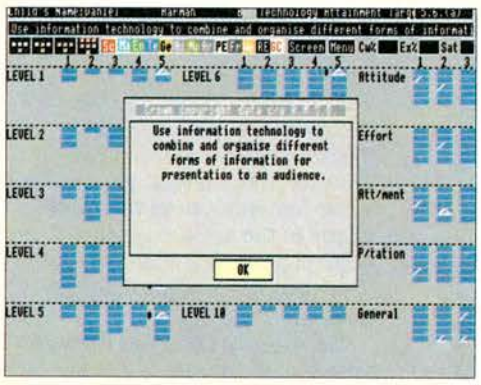
This data is not in any raw form. It is in well-constructed English, every bit as good as most teachers would produce. Such reports can be for any range of subjects, from one only to the entire National Curriculum. Not surprisingly, from a Swansea firm, this includes Welsh. These reports can also be exported as CSV files and then used in mail merging applications such as Impression.

These processes really are simple. HS software sent me the review copy just as I had some end of module reports to do. I have killed two birds with one stone and dealt with my reports as I have reviewed the product. For the first couple of students I felt I was taking too long, but I soon found my way around the screen and was rattling off reports of 200+ words in about three minutes. Even at this speed I had full control over what appeared in each report. All of the report statements are stored as text files and can be altered or completely re-written using Edit.

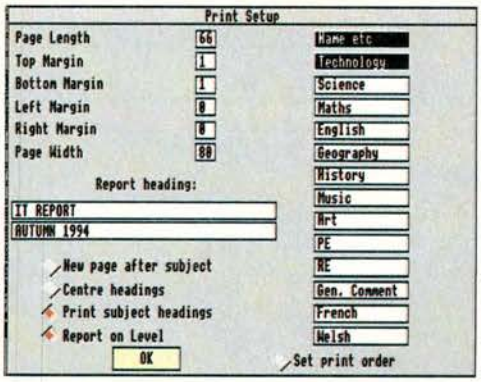
There are other options for printing data which are more geared towards letting the teacher get class data or graph profiles for pupils, and these may well prove invaluable to the conscientious teacher.

Summing up

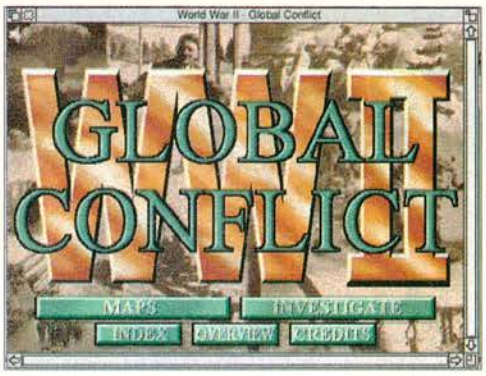
NStore has had a number of previous incarnations, but in version four it has come of age. It is now a truly worthwhile package.



● *The main entry screen. Access to full National Curriculum statements is at the click of a button*



● *Setting up a report. You choose what you want to appear*



● *Global Conflict: the main screen and entry points to the rest of the program*

The world at war

John Clemence assesses what CD-Roms offer students of the Second World War

THE sheer volume of material available within this package is impressive and every visit I have made to the computer has taken me into totally different investigations. The title screen depicts various ways in which the material can be accessed, and includes maps, investigations, index, overview and credits.

Maps presents you with a map of the world, and as you move the mouse around, three different areas become outlined. Clicking on these allows you to zoom in. Buttons at the top of the screen enable you to search for specific maps, maps of specific countries or charts which give additional information about individual events such as, for example, the Ardennes Offensive.

PRODUCT SPOTLIGHT

Product: World War II – Global Conflict
Price: £99.99
Supplier: Academy Television, 104 Kirkstall Road, Leeds LS3 IJS.
Tel: 0532 461528
Requirements: CD-Rom drive, minimum 2Mb of ram

The *index* provides particularly powerful searching facilities, but you have to be prepared to try different approaches to get the information you want. The items can be listed either alphabetically or chronologically, a really useful feature in itself. The information is presented in three columns. The main headings appear in the left hand column, and clicking on one of these gives a set of sub-headings in the middle column. Clicking on one of these gives yet another level of subheadings in the right hand column. As if that were not powerful enough, each column has a small dialogue window where you can enter a search term.

This whole section greatly aids a search for information and highlights just one aspect of CD-Rom use that is so much more powerful than a conventional book. If, for example, you search for *Hitler*, where in any normal index you might expect to find a huge list, here you only get one entry! But click on Hitler in the left hand column and a range of possible areas for research then appears in the middle column.

Click on one of these and your search is further refined in the third column. Click again and you are then taken to a variety of texts, slides, and occasionally, sound clips. Each information screen has a time line for the Second World War above it, and it is easy to see at a glance where in the chronology of the war the information you have found is located. The time line is further enhanced by a black line indicating the timespan covered by material directly available from the current search.

Every topic has either a map or at least one photograph and any of these can be enlarged to fit the full window. Also, any text or graphic can be saved for use in a desktop publishing or word processing package. Pictures in the form of sprites can be saved either as large or small, depending on how much storage space you have and the flexibility of the desktop publisher to accurately scale a sprite.

There are also five investigations which have video clips and sound. They include *Origins, Japanese Expansion, Gotterdammerung, Blitzkrieg* and *Far Eastern Conflict*. These each last several minutes but suffer somewhat from the combined effects of the age and quality of the original film stock added to the degrading effect of the digitising process.

The *overview* takes you through any or all of the features of the package and is well worth working through. Meanwhile the *credits* give you full information about the production teams and all of the sources for the material included on the disk.

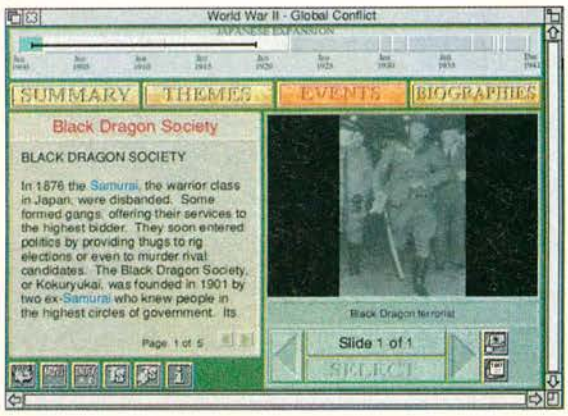
On the accompanying floppy disk there is a utility for creating a *scrap book*. This allows you to create your own file of pictures, sound clips and movies. This is a useful utility allowing you to make up a smooth running program of events from the source material.

However, I do not find it overly user-friendly because its operation has been too simplified. It is also more than a little irritating that the program seems to be incapable of remembering the name of the file you are currently editing. When you want to save it again you have to open a directory viewer and enter the filename into the dialogue box again. There is also a *Trail Saver* option within the main WW2 program that allows you to store and rearrange slides while working through the material.

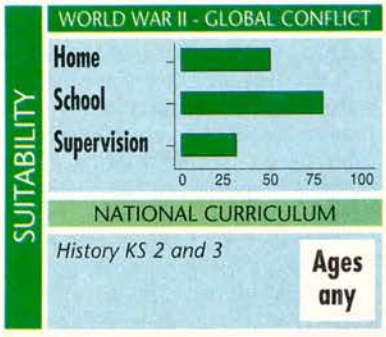
Summing up

I would have no hesitation in putting this in a school library as part of a multimedia resource bank. Although the price of £130 may seem high, the quantity of material coupled with the powerful search routines makes this an invaluable resource to anyone researching the topic of the Second World War.

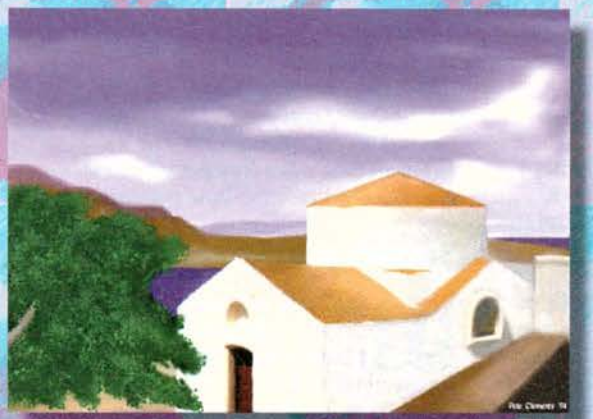
Throughout my use of the package I found all of the on-screen prompts and buttons to be entirely intuitive and very easy to use. Even when there was any doubt, full on-screen help was constantly available.



● *A typical information screen including text and picture image*



The 16 Million Colour Competition

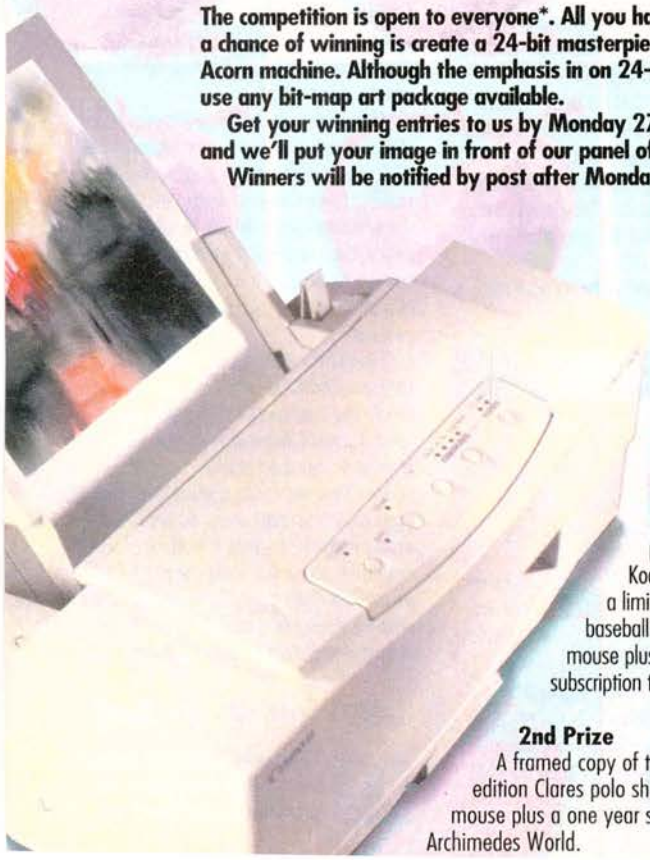


Clares and Archimedes World offer you a chance to win a colour printer in our great art competition

The competition is open to everyone*. All you have to do to stand a chance of winning is create a 24-bit masterpiece using your Acorn machine. Although the emphasis in on 24-bit art, you can use any bit-map art package available.

Get your winning entries to us by Monday 27th March 1995 and we'll put your image in front of our panel of judges.

Winners will be notified by post after Monday 3rd April 1995.



1st Prize
A Cannon BJC600 colour ink-jet printer worth around £500. A framed copy of the winning picture, professionally printed using a Kodak XL 8000 printer, a limited edition Clares baseball cap and Clares mouse plus free one year subscription to Archimedes World.

2nd Prize
A framed copy of the picture, limited edition Clares polo shirt and Clares mouse plus a one year subscription to Archimedes World.

3rd Prize
A framed copy of the picture, limited edition Clares baseball cap and Clares mouse plus a one year subscription to Archimedes World.

Runner's up
Seven runners -up will each receive a free subscription to Archimedes World.

Bonus Prizes
Every entry will receive a discount voucher against the purchase of a Clares product.

General terms & conditions
Each picture must be supplied on a floppy disk along with a text file containing the entrant's name, address and telephone number. Each entry must also be accompanied by a completed entry form - photocopies are permissible. There is no limit to the number of entries you can make. The copyright of all entered pictures becomes the property of Clares Micro Supplies who may use the images for any purpose that it sees fit, without further consent of the artist. All submitted material must be original and the property of the artist.
*The competition is not open to members of Clares' or Archimedes World's staff, their families or associated persons - including freelance authors.

Entry Form

Name ..... Address .....

.....

..... Telephone (inc. code) .....

I declare that the competition entry that this form accompanies is my original work and that the copyright on this is my property to transfer to Clares Micro Supplies whose primary trading address is 98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. I agree to indemnify Clares Micro Supplies and Acorn Archimedes World magazine against any possible claims arising from the use of this image.

Signed ..... Date .....

Exploding the

AGENDA

- Faulty wiring
- Body Building sound
- Midi problems
- Security
- Printer help

Q WHILE playing Populous on my three-year-old A5000, my monitor started crackling noisily and suddenly the screen went blank. I immediately switched off my computer and turned it back on a few minutes later. Now there is no screen except for a thin line of graphics in the centre, and all the writing and icons appear backwards.

Working on the the machine is now impossible but I don't think it's the computer that's broken. What's wrong with it? Can I repair it myself? If not, how much will it cost? Where is my nearest Acorn dealer/repair centre? I keep the machine in a dusty room, perhaps it's just a wire that's burned out?

Shawn O'Flynn, Cork, Ireland

A *You are right to think something is wrong with your monitor but you are being a bit optimistic thinking a wire has burnt out. Wires simply don't burn out unless under severe provocation caused by an excess of current.*

What has gone, however, is your line time-base, possibly the transformer – which, when I think about it, is just wire, so you may be right after all. What happens is that dust accumulates on the components of the line time-base due to the static attraction of the very high voltage found there – sometimes in the order of 25,000 volts.

The accumulated dirt eventually causes a component to short out due to arcing – this was the crack you heard. In fact it is more likely that the ladder rectifier diodes have been blown or the EHT capacitor.

Most Acorn dealers aren't service engineers so probably won't be able to help you. However, any good TV repair engineer should be able to fix this one as it is a common TV fault. The components are quite cheap and with labour should cost you less than £35. But, ask for an estimate first. The technical term when they ask you what is wrong is a line time-base collapse.

Sounds problematical

Q HAVING recently upgraded my old A3000 to a Risc PC, I have a few technical hitches I hope you can help with:

I used to use the Body Building Sound Sampler, but having tried the *!Body_Samp* application I found that it totally hangs the machine when the 'sample' icon is clicked on. Is there a small modification that can be made or a new version available? Also, I use pin one of the Econet socket to output the 5v needed. How can this 5v be obtained on a Risc PC – and where's the Econet socket?

Lastly, I used to use the *mono video out* socket on the A3000 to supply an input to an AV production mixer for titling videos – the mixer provided the colour. This socket isn't available on the Risc PC and although, apparently, a signal can be acquired from the machine, it only works in old TV-resolution modes. Is this right?

Steve Smale, Wimborne, Dorset

A *Unfortunately the Body Build Sound Sampler software will not work with the Risc PC and unfortunately (again) I have not had chance to look into it yet. It can be made to work I am sure, but in order to get the required speed out of the older systems the software accessed the hardware directly and I suspect that the hardware has been moved and changed. I hope to find time to look at the problem soon.*

There is similar bad news on your other application. I suspect that your titling mixer requires a domestic broadcast TV signal which was available on the older machines as modes under 18.

The new machine can't produce those modes, it can only emulate them. This means that the synchronising and video signals are coming out in something like a VGA mode, that is at twice the normal line rate, but the software and memory allocation gives the display the characteristic of the old modes.

Therefore the signal produced by the new machine is not compatible. Any lead you can make will only tap the sync signals from the video connector. If you wanted to make a composite monochrome video signal from the RGB signal you would need to add the three video signals together with weighted resistors as well as mixing the sync pulses and adding them to the signal. It can be done, but at the end of the day it is not going to drive your titler.

...and sounds musical

Q WE have recently bought an A4000 and want to use a Midi keyboard with it. We

SuperArt printing

Q IN response to your answer to Mr. Walker in the September 1994 issue about printing on a Star LC10 from AMX SuperArt, I had identical problems with a Star LC100 colour printer and was able to solve it as follows:

The printer driver for a four colour printer needs modifying to send a carriage return and linefeed to the printer.

To run the program CHAIN"Printer", press execute on the printer number – at top of page – and press 6. Press *execute* on EOL string and type:

```
f4,13 f4,10
```

f4 shows as an inverse C. Now enter printer dump number of -1 which will save the alterations.

Do the same for printer dump 7, which is twice the size, and this will do the trick. Using dip switches has no effect.

Paul H. Archdeacon, Hamilton, Leics

A *Thanks for your help. Printer problems are always the most difficult to solve as the number of hardware and software combinations are almost as great as the number of ways you can fill in a lottery ticket.*

Mike Cook helps out with another selection of your hardware hiccups

time-base

are planning to buy a Yamaha PSS-51 as it is a model my son uses at school for his music GCSE.

Is this keyboard compatible with the A4000? What leads do we need to connect it up? What attachments do we need for the computer? Does it plug into the printer port? If so, is there a device that allows the printer to work without continually fitting and re-fitting the plugs?

What music software do you recommend for a 15-year-old? We want to be able to play music on the keyboard and get it to display the music on-screen, then – when satisfied with it – print it out. We also want the computer to play music stored on disk.

Mrs. R. Newton, Dudley, West Mids

A *To get a computer to talk to a musical instrument, both have to be fitted with a Midi interface. Midi stands for Musical Instrument Digital Interface. The Yamaha PSS-51 has a Midi interface built-in which is fortunate as you can't retro fit Midi on many keyboards. This keyboard is not multi-timbral but is polyphonic. That means that anything you play back through the Midi will have one voice. The more expensive instruments allow you to produce say a drum kit, piano and trumpet all at the same time.*

So what you want now is a Midi capability on your computer. Now Midi data is very similar in form to the serial port but unfortunately you can't use that.

This is because the speed is different and also the voltages defining the 0s and 1s are not compatible. So you see it is not just a matter of making up a lead.

There are a number of Midi interfaces available and as there is not much to the hardware, some are tagged on to other interfaces like the input/output podule produced by Morley and Acorn. These along with MidiMax from Computer Concepts, and some cards from Clares, plug into the expansion card system. An alternative from Vertical Twist is a sampler and Midi interface that plugs in the Econet socket. All these are in the £50 to £100 price bracket. Computer Concepts also produce high quality sound samplers and video digitisers in the £200 to £400 price range with a Midi interface attached.

As for software, there are a number of public domain packages and utilities like !In-Out, which helps patching, and !ArcMidi which is a sequencer. Most of the Midi modules will come with some sort of software. Unfortunately, the majority of software that allows you to record and edit Midi data will not let you print it out in standard music notation. That is because you can do a lot more things to a Midi data file than will show up on a standard score.

However, it is expected that Sibelius 7 V3.0 from Sibelius Software will have real-time input. But be warned, this is not a pocket money application and is likely to cost you serious money. The current version has a step-time Midi input – you decide on screen how long you want the note to play for and then you hit that note on your instrument. This is a professional application and is likely to do all you ever need.

The current version of Rhapsody from Clares has real-time input but the output quality and music formatting is not as sophisticated as Sibelius. On the other hand, if you don't need the complex music formatting, Serenade from Clares is a good bet. It costs £135 and is a 16-track Midi sequencer with the more usual bar notation.

You can get a demonstration version of this from Clares or most PD libraries or even over the Internet. It will do everything except save.

In fact demo versions of most software are available, so it's worth looking at these before you start spending money.

Safe and sound

Q I HAVE recently started my GCSE course work project on security. For my project I have decided to make a device that will lock my computer, an A3010, covering up the disk drive and main sockets at the back, making it impossible for anyone to use. Does such a thing already exist?

Matthew Winter, Burnham-on-Sea, Somerset

A *As far as I know there is not a device specifically designed for the Acorn 3010 to do this sort of thing, but I have seen such devices advertised that clamp round the small Macintosh computers.*

However, there are some non-specific security devices available. The ones I use at the University are large plates with a small loop in them. The plates are self-adhesive pads and the loop has a thick cable threaded through it, round the leg of the desk and finally padlocked. This ensures that when a computer is stolen the desk also goes missing.

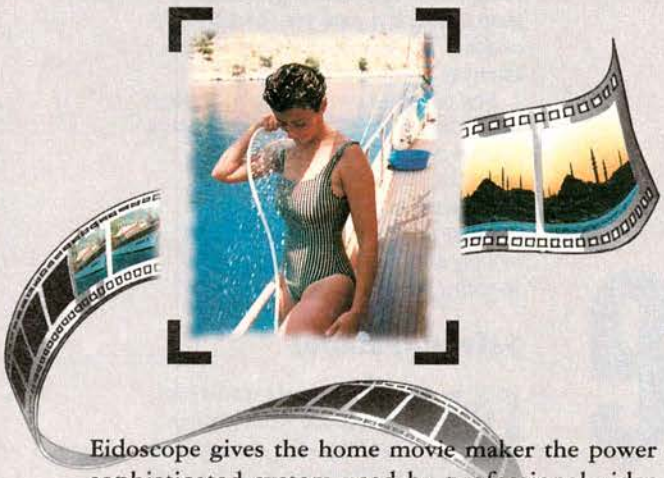
Unfortunately this does not stop the computer being used, but there are more subtle ways of doing this. How about putting a magnetic reed switch in series with the reset button or some other vital signal? If this switch is placed close to the plastic wall of the box, the computer will only run when a magnet is placed against the box. A potential thief wouldn't know this until he tried to switch it on.

Perhaps the ultimate in visual deterrent would be a label saying PC compatible – *who would want that? Though on second thoughts most thieves are low in intelligence so maybe a label saying* Not PC compatible *would do the trick. Best of luck with your project.*

You can write to Mike Cook c/o Acorn Computing, Media House, Adlington Park, Macclesfield SK10 4NP, or e-mail to acorncomputing@cix.compulink.co.uk

He will answer any questions about difficulties you may be having with your machines, mainly those to do with hardware. If you want a personal reply ensure that you enclose an SAE with your letter.

EIDOSCOPE



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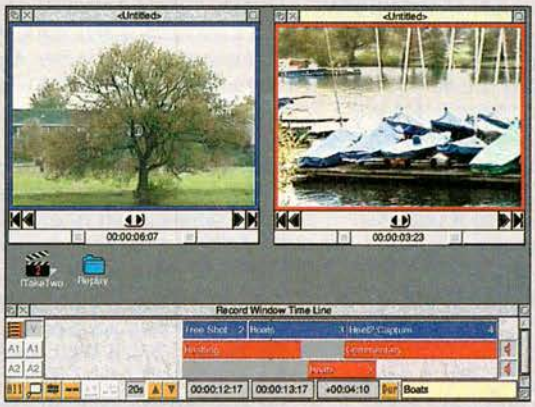

To run Eidoscope you will need:

- Acorn Risc PC
- 4 Megabytes RAM
- Eagle M2 card — available from Computer Concepts*

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Acorn RISC PC

Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX, Tel: 01442 63933, Fax: 01442 231632, Email: Info@CConcepts.co.uk

*The Eagle M2 card digitizes and compresses videos in real time from camcorder or standard VHS tape machine and stored direct to hard disc.

The Acorn User Awards 1994: Eagle M2 card Winner: "Best Expansion Card" Runner up: "Most Innovative Hardware"

SOFTWARE

VIDEO EDITING SYSTEM

EIDOS

On the board walk

Jim Macintosh checks out a PD bulletin board system

IN the December 1994 issue of *Acorn Computing*, Steve Wade took a look at a bulletin board host called *ArchiBoard*. This is a comprehensive ANSI host system that has plenty of potential. If you can't afford to fork out for a commercial package, it's very likely you'll find a piece of software in the public domain that'll do just as much.

One host you may have seen floating around in the PD is !VHost, which is worth a special mention because it is a Viewdata host rather than ANSI. For those of you old enough to remember, Viewdata was the protocol that Prestel ran under, and still does, and is displayed using the teletext Mode 7-style screen.

It is faster than ANSI as Viewdata uses one character for a colour code or effect, whereas ANSI needs to send about five extra characters of gubbins to do anything useful. With a 14k connection and data compression, the result is a menu which appears instantaneously.

Both ANSI and Viewdata have their advantages and disadvantages. In !VHost, Gareth Babb has created a package which takes the best from both and puts them all together in a new protocol called Wizzo. Wizzo is a hybrid. Menus and the like are displayed in Viewdata, but when ANSI is required, for operations such as file transfer, Wizzo flips into ANSI and does the business, before going back into Viewdata.

At present, there is only one Wizzo terminal available (!HippoTerm), but most comms packages allow you to switch between formats. The only difference is that it isn't done automatically, and you are told to switch formats by the host. It would be nice if producers of commercial comms software such as ArcTerm_7 would support some of the PD protocols – especially ones aimed specifically at the Archimedes.

When you first load !VHost you are presented with three windows; a local terminal, a window showing who's on-line, and a list of the last 20 users to your system. !VHost can support more users on-line than you can fit serial ports into the machine and that's quite a few. A French company produces a card with eight serial ports on it, and with four of these cards in your machine you could have 32, at which point, !VHost hardly blinks. If you do encounter a speed decrease, !VHost will also run like lightning outside the desktop.

You will need to prepare your system before you can do anything. The manual explains how to set up a simple board, and a shell is provided for you to work from. A handy application called !PaintIt allows you to convert sprites into Viewdata frames, so that those who can't use the comprehensive frame editor can create impressive menus. Once your masterpiece is complete, you can connect your modem to the phone line and unleash your board on to the world.

Frames – the generic viewdata term for screens – can contain "frame variables", which allow you to add information such as the user's name, the current time, or what line you're on, into your menus, thus allowing effective customisation. Frame variables are provided for nearly everything you could ever want, from the current time to the name of the user who's spent the most time on-line over the last year.

Virtually all of the prompts that !VHost issues can be found in a text file in the application directory, so your system can be tailored exactly as you would like. This means that different boards can have a totally different feel.

Everything in !VHost, including editing, is done while you are logged on. This is because it was originally written so Gareth could edit the system from another house, and not actually have to see the machine it was running on. You can even exit to the OS and take a stroll around the hard drive.

A multi-user chat system is provided, called BCS. This is in fact the core of a multi-user adventure game, and it is already possible to create different rooms to chat in. This could be useful if you were running a very large board as you could have different rooms for different topics. Eventually, BCS will be finished and it will be possible to interact with scenery as well as people.

Hector is your board's resident user. Hector displays useful messages at the bottom of any screen at any time, and these are defined in a text file stored in the system directory. He will also send mail to users as well as participating occasionally in BCS. He also lets you know who's logging on and off, and compiles all the system statistics.

● *!VHost copes with as many users as you can*

!VHost is not for the technophobe. It can be quite technical in places, and the manual will be needed by your side for the first few hours, after which it becomes second nature. It does lack a few features, such as a decent chatmode, but this can be circumvented if you log-on to another port and then chat with the user in BCS.

However, it is fast, easy to use once you've mastered it, and above all, professionally presented. Its speed is remarkable. Even on an ARM2 machine it flies along. This software knocks spots off any other comparable Viewdata software, and proves the exceptional quality of programming available through the public domain.

● *Fogies will remember this! YMODEM is also available*

If you want to run a bulletin board with a difference, and are prepared to sit down and read the manual, !VHost is for you. If you need convincing, it can be seen in operation running CCL4 on (01482) 798249, Viewdata 7E1, speeds to 14,400bps. Alternatively, you can call Village A16 in the Netherlands on (+31) 78 14 97 70. Copies of !VHost can be found on various bulletin boards, although if you can't find it, the sysops of CCL4 will be pleased to help.

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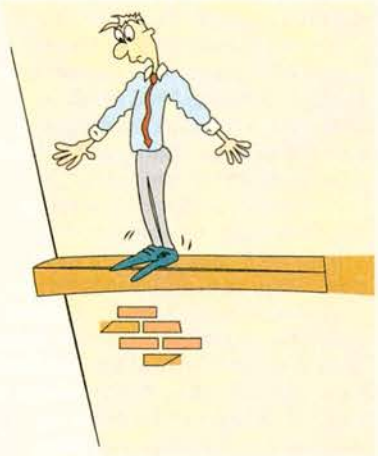

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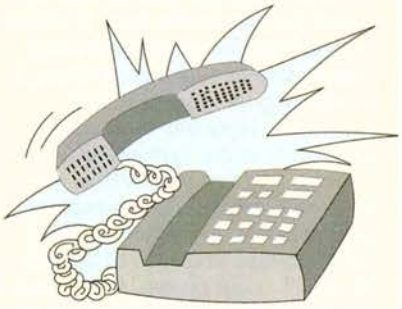

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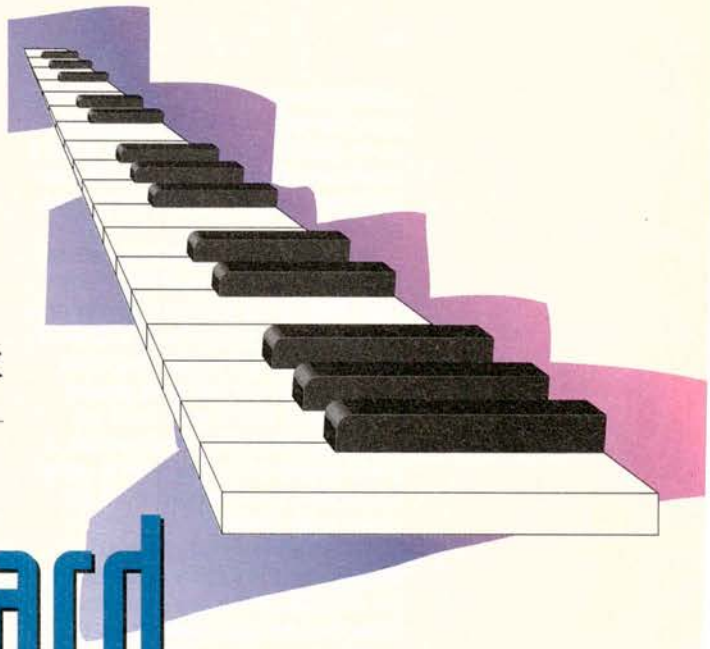
This month Mike Cook's Body Building holds a blast from the past



Keyboard with a difference

HAVE you ever had one of those projects that hangs around half-finished? Well I have, but this month I decided to finish it, prompted by my eldest son, Alec, who is just starting to learn how to play a keyboard instrument at school. Rooting in the cellar one day he came across a 49-key organ keyboard and demanded to know how to make a noise from it.

He wasn't too impressed when I said it had to be plugged into the computer, even less so when he learned that the computer was a BBC Model B. Unfortunately, one of the conditions I had from my wife when the Risc PC arrived was that, "One of the old computers has got to go". This turned out to be the oldest, the Model B.

In order to interface it to a modern computer I had to try to remember what I had done all those years ago. Fortunately it was quite easy to get to grips with, so I thought you would like to know how it is done.

Many years ago, in the early days of electronics, an electronic organ was a popular and very major project. In fact it could easily take over a year to complete as it required many oscillators. Even so, once completed it was very difficult to keep in tune, as the oscillators' frequency would drift with temperature. Needless to say that many were started, but few were ever finished.

However, as digital technology advanced, it became easier to construct, as banks of frequency dividers could generate notes perfectly aligned in pitch with each other. With even larger scale integration, the whole of an organ circuit could be fitted on a single chip, and soon it was cheaper to buy a mass produced organ than to make one. Today there are many cheap keyboards offering all sorts of effects at quite a bargain price. However, if you have your own computer attached, then this gives you the ultimate in flexibility as you can produce exactly what you want.

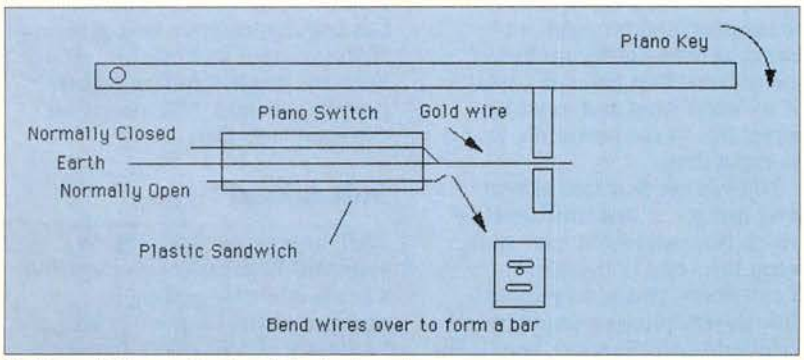
The hard part

This project breaks down into three parts, *mechanical, electronic* and *software*, so let's tackle the mechanical part first.

To me, the mechanical part of a project is always the most difficult, so a bit of cheating does not go amiss. By cheating I mean that I like to buy in as much as possible. To that end I was pleased to see that Maplin – the electronics shop not the holiday camp – sell two types of musical keyboard.

In fact they are no longer in the catalogues, but I inquired at my local branch and they said that they still have a few left. I am sure there are other sources of blank keyboards if you grub around – after all, the electronic organ manufacturers must get them from somewhere.

Now the keyboard is only half the problem. You need to make the keys actuate a switch and there are several solutions to this. Coming off the middle of each key is a plastic tab with a few slots in it – this is used to move a gold wire in a plastic block. These block switches are available ready-built but it is not too difficult to make your own. All you need is some spring wire laid along a piece of plastic, perspex would be ideal, as shown in Figure I. The wires are fixed in place by blobs of epoxy resin or hot melt glue and another piece of plastic is ➤



● *Figure I: The mechanics of the keyboard*

sandwiched over the top. For most uses you only need the normally open connection, but if you want a touch-sensitive keyboard then you will also need the normally closed as well.

Where the common wire meets the other contacts, just bend the wire slightly so it comes to rest on a bar of wire as shown in the inset to Figure I. You get more long term reliability if you use gold plated spring wire, but if you can't get hold of it then it's not essential. A good source of spring wire is metal guitar strings – you can even get them gold plated.

An even better way of making the contacts is to fit a small magnet on the end of the key's tab and have it come into contact with a reed switch, or even better, a hall-effect switch. The latter was covered in my November 1990 article. However, whatever your solution, when you multiply the cost by 49 it does become expensive.

Having got your keys you need to house them in a box. I built the box around my keys with slabs of chip board and plywood along with a square section aluminium tube to provide some rigidity. To finish off, I covered the wood with a black vinyl leatherette material stuck on with contact adhesive. Each piece was covered separately and then assembled using wood screws and cup washers – the whole effect was rather neat.

Electrifying

Now to get on to the electronic side, I had to squeeze 49 inputs into an eight-bit port, and the design I came up with could have coped with up to 64 keys or even more. The secret lays in the use of multiplexers or data selectors, see Figure II. A multiplexer is simply an electronic multi-way switch with lots of inputs and one output. The input that is routed through to the output is selected by the logic state on a number of select lines, in the case of Figure II this is three. The signals are arranged so that the binary number on the select lines corresponds to the input line number routed through to the output.

This is all very well, but as you can see, a multiplexer only has a limited number of inputs. There are chips available with two, four, eight and 16 inputs, so how does this help us cope with 49 inputs?

Well, we can simply cascade the multiplexers as shown in Figure III. This shows a two-level cascade but in practice you can use as many levels as you need. The first level – the one on the right – has one multiplexer with the final output. Its select lines are the most significant bits in the address. Each input in this level is fed by the output of a multiplexer in the next level.

In this second level all the multiplexers address lines are commoned and brought out to form the least significant bits of the address. This gives us a total of six select lines and so we can access two to the power six, that is 64 input lines.

You can see that this second level can go on to a third level by which time we would have nine select lines or 512 inputs. Incidentally, this is, in principal, how the telephone network works – the value on the select lines is the telephone number you want to contact. However, the circuits for the different levels are in different parts of the country.

Figure IV shows how this is used in practice – I have used 74LS151, one of eight multiplexers throughout. However, the second level has six multiplexers all with common address lines and this can lead to a problem of *fan-out*.

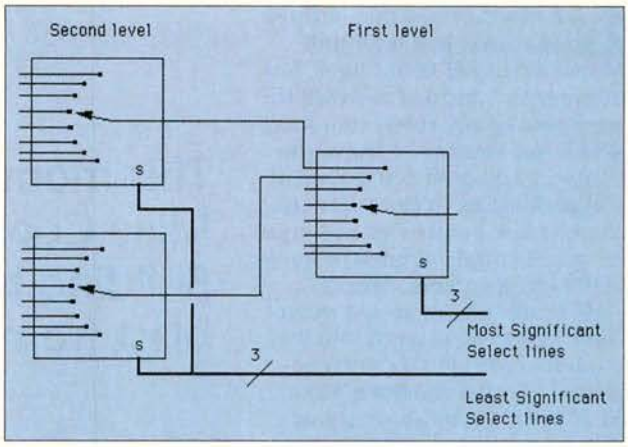
Fan-out is the number of inputs that an output can be connected to and still work properly. With computer outputs this is usually about two, definitely not six. Therefore, these least significant lines are buffered with an inverter. This turns the logic level on these lines upside down, but won't that change which line is selected? Yes it will, but all we need to do is to label input zero as input seven, input one as input six and so on, and the circuit works as before. So that's what I have done in Figure IV.

Finally, as I had 49 keys not 48, I fitted the final key directly into the first multiplexer level. This saved me buying another multiplexer. You can easily see that by fitting two more multiplexers you can bring the number of inputs to 64.

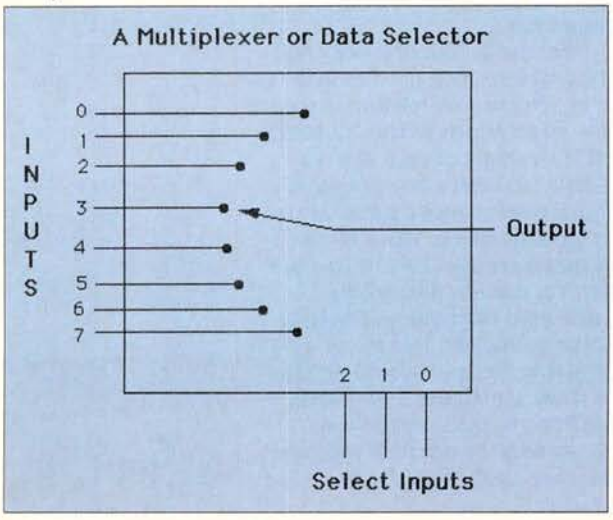
Now we have to connect this circuit to the computer. I have chosen to use the user port but you can use any interface that gives you six-bits output and one-bit input. Even the single direction printer port on the older RISC machines can cope with this.

Soft access

Well, how do we drive this in software? Essentially you can tell if a key is down by putting its number on the output bits and looking at the input bit. If you see a logic *one* the key is up and a *zero*



● *Figure III: Cascading multiplexers*



● *Figure II: The principal of a multiplexer*

will indicate that it is pressed down. The program *Keyboard1* simply scans the keys in turn and prints out the number it was putting on the output when it receives a *zero* on the input.

You can use this to test that everything is in order. The program *Keyboard2* takes this a stage further by converting the key into a note. This is done by using the array *Note%* to hold the number to use for the SOUND statement for each key number. The sound is started when the key is pressed and ended when it is released. It's a little more complex than might at first be thought, because we must remember from one scan to the next, which key is being held down, and only produce a note if it is a new key.

Furthermore we must mark when a key is released so that we can produce a sound when it is pressed down again. Having done all this, our keyboard is still only *monophonic* – it will only play one note at a time.

A *polyphonic* keyboard will allow the production of several notes at the same time and it is possible to do this with our computer. In fact the computer allows us to have up to eight notes playing at the same time by using different channel numbers in the SOUND statement. This is even more complex to sort out and took me some time.

You see if only one note is playing we should assign it to channel one, a second note to channel two and so on. But what happens if channels two and three are still being held down but channel one's note is released and another is pressed? If we assign this new note to channel four we could quickly run out of channels, so the software is a little more clever.

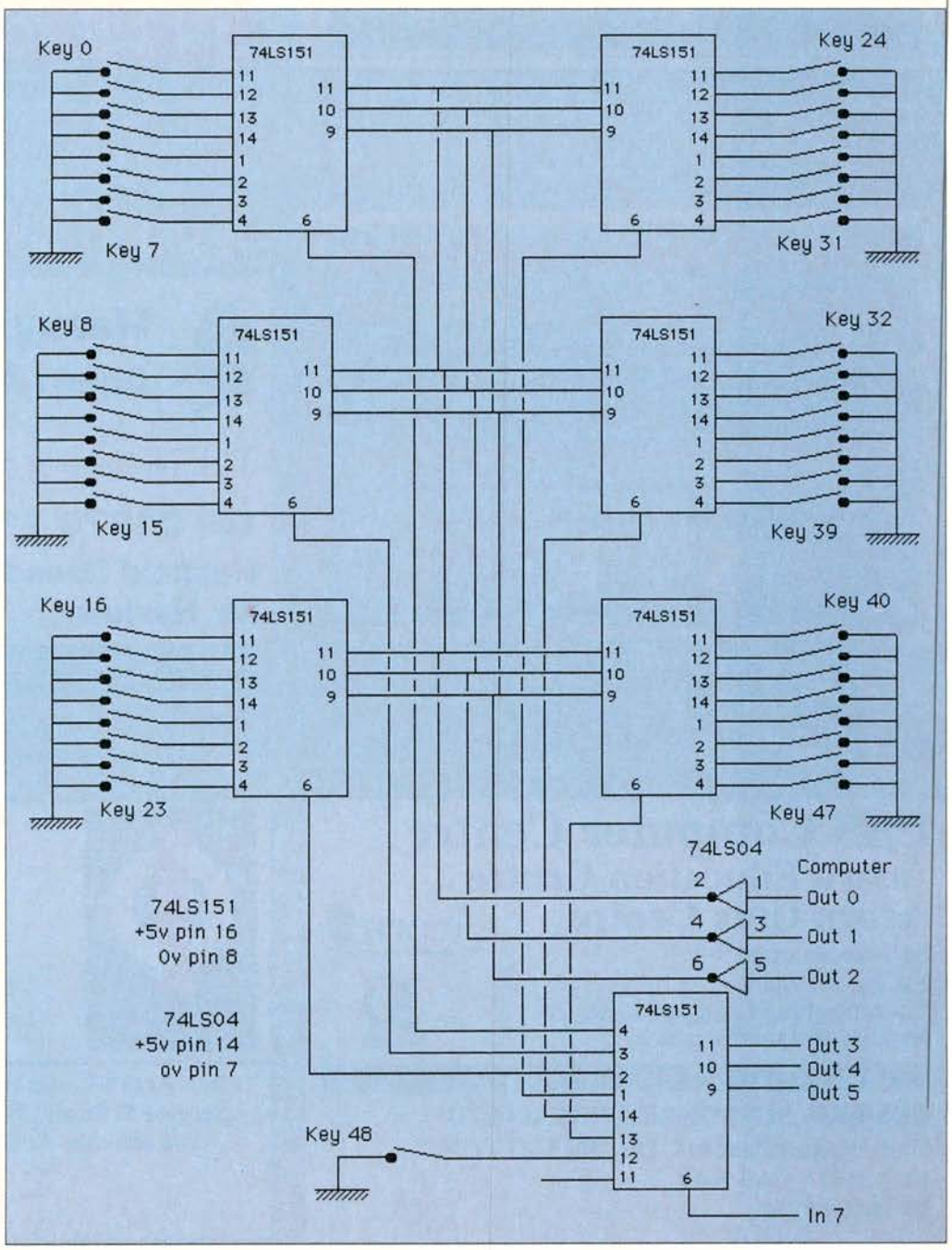
When a key is detected as being pressed, it is first checked to see if it is one of the keys it has noted as being pressed in the past. If not, it assigns it the first channel that is free and plays a note on that channel. This is done for the whole keyboard in turn. After that the program scans only the keys that it knows are being pressed. If it finds one of these is free, it releases that particular channel. The program is on the MegaDisk as *Keyboard3* and as well as playing the note, it also prints on the screen the note number as well as, in brackets, the channel number associated with it.

Fortissimo

Finally, this project has much scope for improvement, in particular it can be used as a touch sensitive keyboard. This is where the harder you hit a key the louder the note is. For this you will need to repeat the circuit in Figure IV, only this time wire up the normally closed contact of the keys to the input of the multiplexer. Send the output of the multiplexer to another computer input, say bit six, and parallel up all the computer outputs.

Now when the computer scans the keyboard it detects which ones have their normally closed contacts open – gives a logic *one* on bit six. Time how long it takes for this key to have its normally open contact closed, and this tells you how hard the key has been struck. You can then use this to control the volume and duration of the note. This would probably have to be done in machine code to get a fine resolution on the key strike.

● ***Well there you have it. See you next month for a very special Body Building article.***



● *Figure IV: The electronic circuit of the keyboard*

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The Lampard collection

Here's a selection of programs both useful and silly. When run from the disk they all assemble machine code which must be saved then run. Basic I users will find that the last line will generate an error, this is due to the OSCLI command to save the code. Ignore the error and just copy the printed line to save.

Lucky and ***Wngway*** are both peculiar Basic line number alterers, and are best described as a practical joke/mild program protection. BBC Basic makes little use of line numbers, and for programs without GOTO/GOSUB and RESTORE <line no> statements, you have complete carte-blanche as to what the numbers can be.

Both the programs need to be run from Basic with a valid program in memory. *WNGWAY needs no parameters and reverses the order of the line numbers – but not the order or their contents – so a program will list as being from say 1280-10 instead of the more normal 10-1280. *LUCKY has to have a valid basic line number (0-32767) after it, and will give this number to every line in your program.

Once a program has been altered in this way it is very difficult to alter/delete existing lines as Basic can't always find them. The RENUMBER command will restore the program to normal line numbers.

An odd quirk of basic that can strike when using these utilities is that if the first line of a program is greater that 256 then it gets scrambled by the OLD command. This really spoils the effect. To get around it I suggest that *after* renumbering you add a dummy line less than 256:

```
*LUCKY 4000
0:
```

As line 0 is less than the number of the first line it is inserted correctly by Basic.

The ***Romess*** program prints out all the text messages from a specified rom. The number may be supplied in decimal or hex – don't use the & with hex.

Romess checks if a valid rom number has been supplied. If not, a syntax synopsis is printed out and the program terminates. If a valid rom is supplied it is paged in – an Electron-compatible routine is included, though untested – and the main loop is entered. Each byte in the rom is examined. If at least four alphanumeric characters in succession are found, they are printed out – very little garbage is output. Finally, the original rom is paged back in and the program ends.

Runplug completely disables a rom and, unlike any other similar utility, it unhooks any extended vectors that the rom is using. The rom can be specified by name or hex number, for example:

```
*RUNPLUG acorn adfs
*RUNPLUG PRINTER BUFFER
*RUNPLUG C
*RUNPLUG 9
```

Names are case-insensitive and the rom is disabled until the next Break – Control+Break on the Master.

Rinsert activates a rom and is mainly intended to be used with the Master's *SRLOAD command as it saves having to press Control+Break and can be used in boot files. You can specify a single rom or nothing, in which case all roms will be activated, as in:

```
*SRLOAD rom1 8000 4 Q
*SRLOAD rom2 8000 5 Q
*RINSERT
```

to insert all roms, or:

```
*RINSERT printer buffer
*RINSERT 9
```

insert a rom by name or socket number. Rinsert attempts to get the rom to extend its vectors by sending it a couple of the service calls that it would usually get on Break. Because of this it shouldn't be used with filing system roms.

I wrote ***Address*** because I wanted an easy way of changing the load/execute addresses of files. Previously I had to *LOAD it and then use the somewhat arcane syntax of the full *SAVE command. Anyway, with *ADDRESS you just need the filename followed by the new load and exec addresses. Note that you must use eight digit addresses even on the Acorn DFS which truncates to six. For example:

To change a Mode 0, 1, 2 screen into one that can be called as just *<screen>, use:

```
*ADDRESS <screen> FFFE3000 FFFFFFE0
```

FFE0 is the location of the OSRDCH routine which will pause the computer until a key is pressed. This can be used to make a file *RUN act as though it has been *LOADed.

```
*ADDRESS <script> 00000000 FFFFFFFF
```

this will convert a *EXEC <script> to one that can be called with just a * on the Master.

```
*ADDRESS <basic file> FFFFFB00 0000
0000
```

will filetype a Basic file so that an Archimedes can recognise it. For other Archimedes file types use FFFttt00 00000000 where ttt is the file type number.

J. D. Lampard

Very long multiplication

The BBC Micro displays results of calculations to nine figure accuracy, and any requiring more figures are printed in scientific notation. So, if you want to multiply 1,000,000 by 1,000,000, you will see 1E12, meaning 1 x 10^12, rather than 1,000,000,000,000. With this program you get exact products as long as the factors do not contain more than 238 digits each. If you decided to enter 238 nines (10^238-1) for both factors, the product would consist of 476 digits, although you would have to wait just over 15 minutes for the machine to work it out.

Jon Millington

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Planning the future

Clem Vogler examines how project management is provided for under RISC OS

AS weary investors cough up for Eurotunnel's latest rights issue and the tunnel full-service date slips a few more months, the need for effective project management tools must be uppermost in the managing director's mind. Even those with lower ambitions, like moving house or setting up a conference, will know how easily costs and time overrun initial expectations.

ProjectING is a graphical tool for project management which boasts the facilities to: Plan a new project, displaying the various stages graphically; Manage the project from day to day; Analyse the time needed for individual stages and the whole job; and Analyse the resources needed.

A mouse-driven drawing tool is used to construct a network with nodes, links and branches. Nodes represent events, and links are the tasks required to fulfil the events. Nodes are shown as circles, squares, etc, according to the type of event represented. Links are labelled to show the expected duration of the associated task.

You enter the project start date and ProjectING calculates the target completion date. As the planning or execution of the project proceeds, any of the network elements may (and will!) be edited to accommodate expectation to reality. For every modification, the software subjects the network to time analysis to show how far the projected date for each stage has slipped behind or overtaken the target date. It identifies in red the *critical path* – the particular sequence of jobs which determine the completion date and where the greatest urgency should be attached.

It also calculates the *floats* – the amounts of time by which tasks may be delayed without affecting related tasks. It enables you to examine the effect on completion date of reallocation of resources or rearranging the sequence of tasks.

In practice

Several things are required if this sort of approach is to be of practical use. Firstly, the software should be easy to use, so that networks can be drawn and edited quickly. ProjectING succeeds because it uses the excellent vector graphics facilities of the RISC OS graphical user interface and analyses the data from the drawing – there is no need to enter data elsewhere in a table or database.

It also provides a satisfactory range of user-definable reports and a hardcopy facility which managed to print my test network correctly scaled on a single sheet of A4 first time – no messing about with scaling or sticky-taping sheets together. Multisheet printing is also possible. Fortunately, the critical path, which is shown red on screen, comes out dashed on a monochrome printer – there is no support for colour printing. Colour plotters using A2 paper are supported with a dedicated driver.

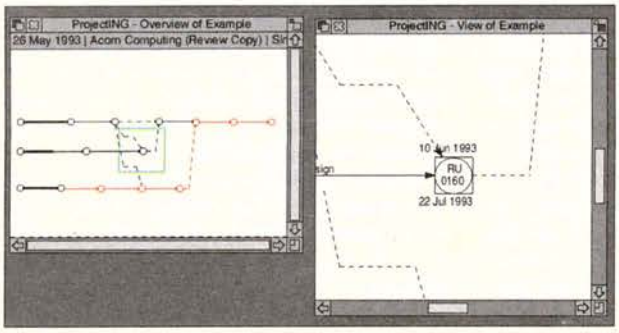
The second requirement is that the project designer should have a clear idea of how the project is to develop. It is sometimes said that to ask a sensible question you need to know most of the answer. Similarly, with planning networks, it is hard to construct the network without having most of the details worked out in advance.

For this reason the network design stage becomes as much a disciplinary tool for making you plan your project effectively, as a management and analysis tool. In this respect, it resembles a rigorous programming language, like Pascal, which makes you plan from the outset and discourages the learn-on-the-job approach which lazy natures like mine prefer.

Pursuing the analogy with programming, project management has several similar features, one of which is that you can compile a library of frequently used network subroutines in the same way as programmers maintain a library of commonly used procedures and functions.

ProjectING also offers resource management facilities. Resources, whether people, equipment or materials can be tabulated and allocated. In theory this helps the project manager to direct resources to where they are most needed and to identify total and stage requirements for each resource.

The data management facilities of this part of the program are fairly limited and, in practice, I would expect to be able to perform these tasks more easily with a spreadsheet. Though the package is able to export reports as CSV or TSV files, it is not possible to import spreadsheet data into the resource management module.



● *Overview and detail*

Summing up

I think ProjectING is a worthwhile package, optimally designed for projects to which several people have input. It lacks some of the sophisticated analytical and drawing features of (expensive) large project management systems, but benefits from simple, intuitive editing facilities and an unconstrained network specification, easily adapted to particular projects. The main drawback is the price, which reflects the product's niche position in the Acorn software market.

There is a cut-down version called PlannING which has no resource management capability, more limited analysis and reporting and no plotter driver. PRES maintain that ProjectING sets no constraints on project size, whereas PlannING has some limitations – but these are not specified. The data format of both packages is the same and the tutorial example supplied ran equally well under either package. As I think resource management is the weakest and least essential facility, there is a good argument that the much cheaper PlannING is better value.

PRODUCT SPOTLIGHT

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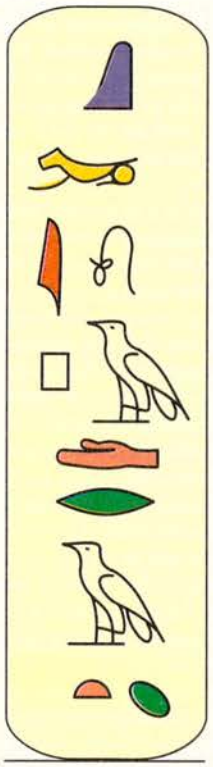

WITH reference to Mr Brannan's letter in the December issue, there is a hieroglyphic font (unhinted) in my Phases: Ancient Egypt packs, which is published by NW SEMERC. This font can be used with any program and includes the basic alphabet in positive and negative form, a mono-spaced version – useful when creating word squares – and a selection of bi- and tri-laterals. Additional characters are available as drawfiles.

The five disk pack also includes clip-art, a selection of borders, word puzzles and information sheets. All the documents are in Phases format but I've just completed a version which is in text and drawfile format so you can use these resources in any DTP package.

Des Thomas, Crowborough, East Sussex

Midi power

I AM a musician and the proud owner of an Acorn Risc PC. Unfortunately there is a shortage of Midi sequencing software for Acorn computers. There are a few packages that run under DOS and Windows which may, one day, be available to Risc PC owners once the PC card is available and when a Windows driver is written for the Acorn Midi interface. Don't hold your breath.

I am also the proud owner of a copy of Sibelius 7. For writing scores it's wonderful, and facilities are constantly being added to enhance its power and ease of use. It is not, however, a sequencer and neither should it be. It does support Midi to an extent, allowing step-time Midi

Compatible scanning

JUST recently I was offered a hand scanner by a relative who owns an Apple Mac as he has just bought a flatbed scanner. I was wondering if this scanner would be compatible with my 2Mb A3010?

The scanner is a Typist from Caere and plugs into an interface which also comes from the Caere Corporation. The interface cable fits into the parallel port of my A3010 but I have not yet tried attaching the whole system to my computer as I don't want to damage anything.

If the scanner did work would I have to buy software for it or can it be used on any wordprocessor? At the moment I use the Advance Package by Acorn. I have looked in the user guide and it doesn't contain any information about scanning.

Adam Benli, Hurst Green, East Sussex

Well we can assume that the scanner itself works but the interface is designed for an Apple Mac – and on a Mac, the 25-pin socket is the SCSI port, so what you've got is a SCSI hand-scanner. This is good, but don't try plugging it into the printer port. What you need is either an internal SCSI interface or the Atomwide Printer Port SCSI to allow connection and then you'll need software.

There are two main reasons for scanning – the first is where you scan a picture or document which becomes a sprite file and can be manipulated as such. The second is when you are scanning words as with an OCR – optical character recognition – package and to do this you need an additional piece of software.

Scanning software usually accompanies the hardware but you could contact Computer Concepts or RISC Developments to see if they would be able to sell this separately. OCR packages like Optical from Neurotron can perform their own scanning as long as you have a TWAIN driver for your scanner – the best source for information on this is David Pilling who can be contacted on (01253 852806).

However, if you do want OCR support it might work out to be easier and cheaper to start afresh with a complete scanning system with a flatbed rather than a hand scanner, as successful OCR work needs a very steady hand.

input and basic General Midi output.

Sibelius Software inform me that real-time Midi input will come on-line soon, but I guess that this may not be quite as sophisticated as with the specialist sequencers like Cubase. I am also told that Midi files will be supported, I trust both for input and output.

What I am looking for are people who can help me develop a few basic, no frills sequencing and editing applications for Acorn computers. These are to be useful on their own, but their ability to interface with Sibelius via Midi files would make them very useful composition tools.

Steve Atkinson, Burley, Leeds

If anyone is interested in this or in forming a Sibelius User Group, please send your letters to Acorn Computing and we will forward them to Steve.

Artistic Beebs

I OWN a BBC Master 128 and have just recently purchased an AMX mouse from Watford Electronics. When I asked about their AMX SuperArt rom and disk I was told they did not have it in stock anymore.

Only having Timpaint as a drawing package I was wondering where I can obtain a copy of SuperArt or anything else for the AMX mouse.

James Forrest, Taunton, Somerset

These products are very old now but if anyone has a copy lurking in a cupboard which they would like to sell/give to James, you can contact him via the magazine.

An added dimension

HAVE you encountered any software for Acorn machines capable of producing 3D animations as have been seen in some pop music videos of late? I would be willing to buy any computer system which will let me do this but would prefer to opt for an Acorn machine. I hope you can help.

M. Chatterley, St. Clement, Jersey

There are a range of programs and companies which will do what you want: Euclid and associated programs from Oak Solutions instantly spring to mind, while Silicon Vision's FilmMaker is another option, as is Render Bender II from Clares.

Combining this with music will require a product like Empire from Uniqueway.

Window sprites

I AM writing a desktop application for the A3000 which, among other things, creates a sprite on the screen outside the desktop. I need to get this sprite into a window on the desktop, so how can I do this without saving it to disk and using **IconSprites*?

R.J. Waters, Spalding, Lincolnshire

There's no short answer to this except: Read the manual. For serious programming you really have to have a copy of the RISC OS PRMs while initially you can get by with one of the introductory texts.

From here to eternity

THE Risc PC has been praised as an excellent machine and rightly so. RISC OS 3.5 is a substantial improvement but it does have some obscure bugs. It could just be me but some very strange things have been happening.

The date in the Filer windows is wrong – it is a day later than it should be. For example, I created some files on my RISC OS 3.1 A3000 on the 7, 21 and 26 of October. However, when transferred to the Risc PC, these report the 8, 22 and 27 of October.

However, both machines give identical results from OS_File 5. This also happens the other way round. If a file is saved on the Risc PC on 2 December, it is shown on the Risc PC as saved on 2 December, but on the A3000 it is shown as from 1 December. Both internal clocks are set to the same time and date, but it is possible to have display saying a file was saved *tomorrow*.

When using a file opened in OPENIN and PTR#f=EXT#f, at this point EOF#f returns TRUE, but BGET#f *always* gives &FE instead of an *End of file* error. If BGET#f is called again then it gives the correct EOF error. This also happens on the A3000.

Strangest of all, this error again concerns open files. I am currently writing a hard disk backup program which basically opens a file, fills it with data, closes it and asks for another disk to carry on. It multi-tasks on the desktop leaving the file open while it calls *Wimp_Poll*.

I also had another program running which had an open file but was not outputting anything to it. When the program trying to restore the backup crashed, I examined the backup produced and found that it contained data from the second unrelated file.

I have repeated this several times on the Risc PC but when I try the process on my A3000 it works perfectly. This could be a programming error on my part, but it seems strange that a procedure that works on the A3000 does not work on the Risc PC. Could it be that RISC OS is somehow confusing its file handles?

Theo Markettos, Liphook, Hants

The last fault is easy. When a file is created it is allocated a portion of the disk to expand in to. If the program crashes, the file is not closed properly so if you then load it, it contains the data that was on the disk in the area that was allocated to it. The data you get will be completely random which is why it wouldn't duplicate on the A3000.

The EOF error may be a bijou little bugette but not really significant. Why are you reading data from a file when you know the pointer is off the end?

The date problem is interesting but we haven't been able to duplicate it. Perhaps the machines think they're in different time zones on opposite sides of the international date line.

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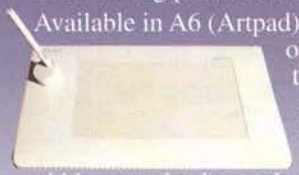

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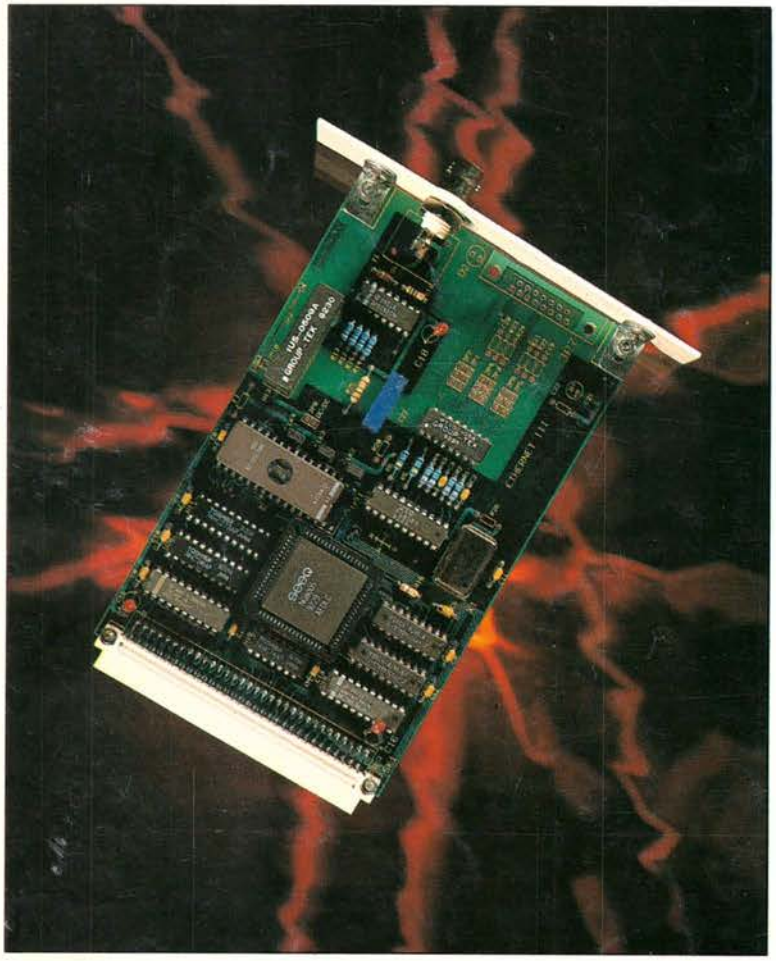

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